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DISEASES CAUSED BY BACTERIA AND FUNGI.

I. CARMICHAEL, J. (1936). **Notes on Tuberculosis in Uganda.**—*Conf. vet. Res. Brit. E. Afr. 1936.* pp. 98-100.

II. WILCOCKS, C. (1936). **Extracts from Note on Work on Tuberculosis during 1935 in Tanganyika Territory.**—*Ibid.* pp. 100-104.

I. Investigations in Uganda indicate that TB. in man and animals is much commoner than was formerly supposed. All cattle live in the open, but the incidence is very high in Ankole stock and very low in pure zebu cattle. Typing indicates that all strains are typical dysgonic bovine of normal virulence. Uganda cattle cannot be infected with even large doses of local human culture. It was discovered that TB. is not uncommon in sheep and goats in Uganda ; the type of organism isolated was bovine, except in one case, in a sheep, where the human type of organism was found [see also *V. B.* **6.** 734].

II. This note deals chiefly with the incidence of TB. in the native population. Experiments are in progress on artificial immunization with dead bacilli, but are unfinished. A table is included showing the results of tuberculin testing on natives – positives vary from 50-74%. Infection in cattle is reported as being 70 cases in two years in the Iringa district, but there were very few cases in Chagga cattle.

—J. C. WALLACE.

BROOK, G. B. (1937). **Cattle Tuberculosis in Canada.**—*Vet. J.* **93.** 285-294 and 317-330. 1 text fig., 8 figs. on 4 plates, 1 table, 7 appendixes. [Num. refs.]

B. reviews the history and development of the control of TB. in Canada. From the outset the general organization of control work has been under the direction of the Federal Government, which operates through a Tuberculosis Division of the Veterinary Branch of the Department of Agriculture. The first measure, introduced in 1897, began with free tuberculin testing, and was succeeded by the Supervised Herd Plan (1905), the Municipal Tuberculosis Order (1914), which was the first legislation under which eradication was attempted using the slaughter-compensation method, and the Accredited Herd Plan (1919) for the control of pedigree herds. At the present time three schemes are in operation :– the Accredited Herd, the Accredited Area and the Supervised Herd Plans. In

the first two schemes, compensation is paid for the slaughtered reactors, and the latter scheme may be considered preparatory. The owners of nearly one third of all the cattle in the Dominion are members of the schemes and the success attained is reflected by the following results :– (1) the incidence of tuberculous carcasses in the packing stations has fallen during 1925-1935 from 7·5% to 2%; (2) in 1934, 69% of all cows supplying milk to 25 cities of 10,000 population or more were TB.-free; (3) the agriculturalists as a body are co-operating to reduce TB. to a practical minimum (0·5% or less) throughout the country. The standard tuberculin test is carried out in the caudal fold, and this may be supplemented by other methods. This test has on the whole proved its reliability, although in individual herds occasional non-specific reactors due to avian TB. and so-called " skin tuberculosis " have been found.

The cleanliness of the milk supply is controlled by the local authorities, which have the right also to inspect the farms supplying the milk. Pasteurization of the milk is favoured and 88% of the quantity supplied to 36 cities is now treated in this way, but the dairy export products are not necessarily manufactured from tubercle-free milk.

The report concludes with a short account of the veterinary education of the farmer and of the organization of the veterinary department in control of TB. eradication work.—S. J. Edwards.

Brook, G. B. (1937). **Subcutaneous and Cutaneous Lesions in Cattle which Sometimes cause Hypersensitiveness to Tuberculin (So-Called " Skin Tuberculosis ").**—*Vet. J.* **93.** 135-141. 4 figs. [13 refs.]

" Skin tuberculosis " occurs in cattle throughout the U.S.A. and Canada, and a proportion of these cattle are sensitive to tuberculin although they show no gross lesions on autopsy [see also *V.B.* **6.** 574, and **8.** 7]. On Prince Edward Island 195 reactors were slaughtered in 1935 and, of these, 172 showed no visible lesions other than those of " skin tuberculosis ".

The lesions which may be detected by palpation occur in the skin of the fetlock, hock or forearm and less frequently on the trunk and eyelid. They are situated subcutaneously, but are closely related to the skin and take the form of hard painless nodules. When they are multiple they generally occur in chain formation as if arranged along the course of lymphatic vessels. Sometimes the nodules persist unaltered for years or undergo atrophy but, in other cases, they rupture and finally heal.

Several investigators have reported that the histological appearance of the lesions is indistinguishable from that of tuberculosis and acid-fast organisms have been demonstrated microscopically in a considerable proportion of cases. In the great majority of instances, however, cultural and biological examinations have been entirely negative and where organisms have been recovered they have not given the typical reactions of *Mycobact. tuberculosis.* The aetiology of the condition is, therefore, regarded as obscure.

The present day policy in North America is to kill all reacting cattle which show skin lesions because of the possibility that the reaction may be due to coexistent tuberculosis.—F. Blakemore.

Dobberstein, J., & Wilmes, H. (1937). Zur Pathogenese und Histogenese der experimentellen Fütterungstuberkulose des Kalbes nebst Beiträgen zu ihrer Altersbestimmung. [**Pathogenesis and Histogenesis of Peroral Tuberculosis in Calves**].—*Arch. wiss. prakt. Tierheilk.* **71.** 427-439. 2 figs., 1 table. [Numerous refs.] [Brief note appeared in *Tierärztl. Rdsch.* **43.** 279].

The pathogenesis of primary alimentary TB. was studied in 20 out of 41 calves given a single dose of tubercle bacilli. The animals, which came from cows free of TB., were 10 days old at the beginning of the experiment and were negative to the tuberculin test. The dose of bovine tubercle bacilli was given either in a capsule or in milk from a flask fitted with a teat.

They were killed after intervals ranging from 22-149 days and a careful autopsy was carried out. Histological sections were prepared from the 20 animals in which there was macroscopic evidence of TB. In 16 animals, the retropharyngeal lymph nodes were affected, although the tonsils showed lesions in only three of these, *i.e.*, in 13 cases the " primary complex " was incomplete. The mesenteric lymph nodes were the seat of primary TB. in 12 animals, in 11 of which the intestine was also affected, the lesions in the latter being usually found in the Peyer's patches of the ileum. The lungs and associated lymph nodes were affected in three animals and the presence of primary lesions at this site is explained on the theory that either the bacilli reached them after entering the intestinal wall without producing the usual " Umstimmung ", or, and this is considered the more probable explanation, the contents of the capsule were returned to the mouth during rumination and small quantities entered the respiratory system.

A number of important observations on the estimation of the age of tuberculous lesions from their macroscopic and microscopic characters are also given.

—E. G. White.

I. Nieberle, K. (1936). Pathologische Anatomie und Pathogenese der Tuberkulose und ihre Bedeutung für die Fleischhygiene. [**Pathology and Pathogenesis of Tuberculosis and its Importance in Meat Hygiene**].—*Dtsch. tierärztl. Wschr.* **44.** 687-691. [Also appeared in *Berl. tierärztl. Wschr.* **52.** 661-665].

II. Meyn, A. (1936). Bakteriologische Ergänzungen zu den Ausführungen von Nieberle. [**Bacteriological Supplement to Observations of Nieberle**]. —*Ibid.* 691-692.

III. Nicolaus, W. (1936). Untersuchungen über die chronische Lungentuberkulose des Rindes. I. Erscheinungsformen. II. Genese. [**Chronic Pulmonary Tuberculosis in Cattle. I. Forms. II. Genesis**].—*Tierärztl. Rdsch.* **42.** 143-149 and 246-251. 2 text figs., 17 figs. on 1 plate, 2 tables. [6 refs.]

I. In a valuable paper, N. briefly summarizes the results of his recent extensive study of the pathogenesis of bovine tuberculosis, with particular reference to the infection of meat with tubercle bacilli.

In man, there are two main types of tuberculosis in which there occurs what N. terms " frische Blutinfektion ": acute miliary tuberculosis in children and typical acute miliary tuberculosis in adults. In the former, generalization occurs from a primary focus, which is readily demonstrated. In the latter, on the other hand, the origin of the miliary infection is not clear. Both these types are found in cattle and in 15 of 23 cases examined bacteriologically, representative of both types, tubercle bacilli were found in the meat. In late generalization the lymph nodes are often not involved ; in early generalization they invariably show tuberculous changes.

The most important part of the investigation consisted in studying the pathogenesis of those forms of tuberculosis in bovines in which there occurs fresh, dry, infiltrating caseation. A good example is " mastitis caseosa ": the udder here shows large areas of caseation, rather like infarcts, surrounded by an area of hyperaemia, and extending by infiltration in all directions. In histological sections,

tubercle bacilli are seen in large numbers at the periphery, and they readily enter vessels damaged in the caseating process. A tuberculous " bacillaemia " is thus demonstrable under the microscope. The peripheral hyperaemic zone is a particular danger, since the erosion of the vessel walls in the caseating process allows the bacilli to enter the circulation. Exactly similar changes occur in the lymph nodes and both udder and lymph node thus liberate enormous numbers of bacilli into the general circulation. In 13 cases bacteriologically examined, tubercle bacilli were found in the meat. Exactly similar changes occur in rapidly-caseating lobular pneumonia in cattle (" galloping pneumonia "). In 18 out of 21 cases, examination of the meat gave positive results for tubercle bacilli. Similar results were obtained in caseating tuberculosis of the adrenal, kidney, uterus, ovary and serous membranes.

The importance of these findings cannot be exaggerated. Whilst it is certain that in any progressive tuberculous process there occurs a liberation into the circulation of occasional tubercle bacilli, we have here enormous numbers of bacilli, so numerous as to be readily demonstrated in histological sections. N. pleads for a study of the qualitative characters of tuberculosis in meat inspection ; this is far more important than their quantitative character. For example, a small area of dry caseation with a marginal hyperaemia is far more important than widely distributed tuberculous lesions of a productive character, owing to its ability to give rise to " frische Blutinfektion ". It is pointed out that the old conception that tuberculosis of muscle lymph nodes indicates tuberculosis of the muscle and bone-marrow of the affected quarter only, is incorrect ; tuberculosis of bone-marrow can only be haematogenous in origin, and thus indicates a tuberculous " bacillaemia."

II. A summary of the results of bacteriological examination of the cases studied by Nieberle. Tubercle bacilli were found in the meat in 69 out of 82 cases. Both cultural and animal inoculation were positive in 26 cases, animal inoculation alone in 39 cases, and cultural examination alone in 4 cases. Cultivation of the bacilli was carried out on Petragnani's medium, as preliminary experiments showed this medium to be the most suitable. Cultural and animal inoculation showed the bacilli to be of the bovine type in every case. An attempt was made to estimate the number of bacteria in the material examined by arranging that each tube of medium should be inoculated with the emulsion prepared from 1 g. of muscle ; the number of colonies per tube gave a very approximate idea of the number of live bacilli in the sample. The number varied from 1 to 60, the usual range being 1 to 5. The results are to be compared with those of 150 cases reported by M. a few years ago, these cases being taken at random and not selected according to their anatomical form, as was the case in the later experiments. In the early work only 3·3 % of positive results were obtained.

III. N. carried out a detailed study of the distribution of the lesions in the lungs of 1,145 cattle condemned for tuberculosis at meat inspection. The distribution of the lesions in the lungs and associated lymph nodes is classified into a relatively small number of groups, the classification depending primarily on the lymph node changes and secondarily on those in the lung tissue. The method adopted is, in the main, that introduced by Nieberle in his pioneer work on tuberculosis in animals. In 244 cases, in which a complete *post-mortem* examination was carried out, examination of the skeletal muscle was made for the presence of tubercle bacilli. Details of the method used are not given. In 41 animals a positive result was obtained and these were composed for the most part of cases of miliary tuberculosis or of early generalization without miliary tuberculosis [compare with Nieberle's results in selected cases].

The second part of the paper deals in more detail with certain forms of

pulmonary tuberculosis, and is unsuitable for abstraction : reference should be made to the original article. The coloured diagrams of the distribution of the lesions, together with a scheme showing the development of the various forms of tuberculosis in the lungs, are very useful features of a valuable paper.—E. G. WHITE.

CERKOWNY, A. (1937). Gruzlica u cielat rzeznych. [**Tuberculosis in Calves**].—*Hig. Prod. Zwier.* **2.** 49-56. 1 fig., 1 table. [16 refs.] [French summary]. Suppl. to *Wiad. weteryn.* **16.**

C. describes ten cases of TB. in calves 10-14 days old. The lesions were localized in the liver and hepatic lymph nodes, indicating a congenital infection. —A. SZWABOWICZ (Lwów).

I. SCHARBIUS, J. (1936). Ueber Tonsillartuberkulose beim Schwein. [**Tonsillar Tuberculosis in Swine**].—*Inaug. Diss., Leipzig.* pp. 31. 3 tables. [Num. refs.]

II. ROSENFELD, W. (1936). Ueber Tonsillartuberkulose des Schweines nach Untersuchungen am Material des Schlachthofes in Königsberg/Pr. [**Tonsillar Tuberculosis in Swine**].—*Inaug. Diss., Leipzig.* pp. 34. 4 tables. [Num. refs.]

I. For the purpose of testing the adequacy of the existing meat inspection regulations S. examined histologically the visibly-normal tonsils of 100 pigs for the presence of TB. The pigs were divided up as follows :– in 62 there were tuberculous pharyngeal lymph nodes (group a) ; in 21 there were tuberculous pharyngeal lymph nodes and lesions in the liver or mesenteric lymph nodes (group b), and in 17 there was generalized TB. (group c).

Tonsils of 23 animals (group a), 7 (group b), and 8 (group c) gave positive evidence of tuberculosis. S. believes that the frequent appearance of TB., actinomycosis and necrotic foci justifies the inclusion of a provision in the meat inspection regulations for the obligatory removal of tonsils after inspection.

II. R. carried out similar experiments on 100 pigs with the same object as S. and arrived at somewhat similar conclusions. He found TB. in 30% of the tonsils examined as compared with 38% by S. He believes that tonsillar TB. is a primary disease which in a proportion of cases may only be diagnosed histologically and he agrees with S's demands in connexion with meat inspection regulations.—M. BURKE.

GRIFFITH, A. S. (1937). **Types of Tubercle Bacilli in Equine Tuberculosis.**—*J. comp. Path.* **50.** 159-172. 4 tables. [6 refs.]

G. gives the results of his investigations on 25 cases of equine tuberculosis since 1922. In 24 cases the bovine dysgonic type of bacillus was isolated, and in one case the human eugonic type. Half of the bovine strains were fully virulent for the test animals and half were of low virulence. The human strain was of low virulence. G. gives details of the lesions found in the 25 cases, but in 5 instances only single organs (the spleen or a single mediastinal or mesenteric lymph node) were submitted and nothing was said regarding the presence or absence of lesions elsewhere in the body. Of the remaining 20 cases, in one the thoracic cavity only was affected, and in two the abdominal structures only ; in the other 17 the infection was generalized. The spleen was affected in 16 cases.

He gives details of every case and the results of the inoculation experiments on g. pigs and rabbits, in tabular form.

I. AUBRY. (1936). Tuberculose humaine et tuberculose aviaire. [**Human and Avian Tuberculosis** .—*Bull. Soc. vét. prat. Fr.* **20.** 206-208. Discussion pp. 235-237.

II. SMITH, J. (1937). **The Bacteriology of Tuberculous Abdominal Adenitis.** —*Edinb. med. J.* **44.** 165-171.

III. MILLER, A. R. (1937). **Types of Tubercle Bacilli in 100 Cases of Non-Pulmonary Tuberculosis.**—*Ibid.* 260-265. 3 tables.

I. A report of TB. in a flock of pullets which was thought to have been caused by feeding the birds upon refuse from a restaurant. Because one of the restaurant workers was suffering from open TB. it was assumed that the pullets were infected with the human type of bacillus. [However, there is no evidence that the causal organism was accurately typed, and the report should only be accepted with considerable caution]. In the resulting discussion on the paper no points of interest were raised.

II. An address in which the importance of the bovine type of tubercle bacillus in the production of abdominal TB. of man is stressed. In addition it is stated that pulmonary TB. in man is sometimes due to the bovine type, the organism having gained entrance to the intestinal tract and having passed directly to the lungs.

III. The type of tubercle bacillus isolated from 100 cases of non-pulmonary TB. in man was ascertained. The percentage of cases of bovine type infection in the 40 patients under six years of age was 7·5%, and in the 60 patients 5-16 years of age it was 10.—E. J. PULLINGER.

GRIFFITH, A. S. (1937). **Mixed Infections with Human and Bovine Tubercle Bacilli in the Human Subject.**—*Tubercle, Lond.* **18.** 193-198. [14 refs.]

In Great Britain, in 10,000 cases of tuberculosis bacteriologically examined, 10 cases of mixed infection have been found. G. describes another case. The bovine type only was found in the affected meninges. At first direct cultures from the lung were thought to contain the bovine type only, but after prolonged cultivation the human type also was discovered. G. advises the use of direct culture where possible; if g. pigs are inoculated, they should be killed as soon as the local lesion is obvious and cultures made from the lymph node nearest the local lesion. By observing this precaution the possibility of mixed infection being due to spontaneous TB. in the g. pig will be obviated.

G. mentions nine cases of mixed infections with bovine and avian types in pigs and cattle and one case of infection with bovine and human types in a pig. —C. MCGAUGHEY.

I. ANON. (1937). **The Diseases of Wild Animals.**—*Lancet.* **232.** 703-704. [1 ref.]

II. WELLS, A. Q. (1937). **Tuberculosis in Wild Voles.**—*Ibid.* 1221. [4 refs.]

III. ANON. (1937). **Tuberculosis among Wild Field-Voles.**—*Ibid.* 1233-1234. [1 ref.]

IV. ANON. (1937). **Tuberculosis in Voles.**—*Brit. med. J.* June 5th. 1165. [1 ref.]

V. GRIFFITH, A. S. (1937). **Experimental Tuberculosis in Field-Voles and Mice.**—*Vet. Rec.* **49.** 982-984. [10 refs.]

I. Disease is a wide-spread natural phenomenon in nature and this accounts for the marked cycles of abundance and scarcity, such as are seen in the wild vole and the partridge.

II. 134 voles received from seven different centres in the British Isles were found with microscopic tuberculous lesions in which acid-fast bacilli had been demonstrated. It is suggested that the disease in voles may be wide-spread.

III & IV. Annotations concerning II.

V. In experiments on field-voles, three inoculated (subcut.) with bovine

tubercle bacilli subsequently died of generalized TB. Seven voles were inoculated with human bacilli with less certain results. Experiments on mice (*Mus sylvaticus*) and white mice showed that these animals, as well as voles, are susceptible to tubercle bacilli of the bovine or human type.

G. discusses the early work of KOCH on the artificial infection of small rodents with TB.—BRENNAN DEVINE.

FRAENKEL, E. M., & PULVERTAFT, R. J. V. (1937). **Studies of the Properties of some Strains of the Tubercle Bacillus.**—*Tubercle, Lond.* **18.** 145-152. 1 fig., 2 tables. [9 refs.]

The results of filtration experiments with smooth and rough cultures of *Mycobacterium tuberculosis* suggest that filtrability may be due to the presence of immature bacilli or granulae, or to the presence of smooth types of organisms possessing a small electric charge. The assumption of the existence of an ultra-visible virus and the production of a distinct type of tuberculosis by this virus has had to be abandoned.

A transparent medium on which tubercle bacilli grow well is described. —C. MCGAUGHEY.

BIRKHAUG, K. (1937). B.C.G. Vaksinen. En kritisk analyse av det eksperimentelle og kliniske grunnlag. [**The BCG Vaccine. A Critical Analysis of the Experimental and Clinical Experiences**].—*Nord. med. Tidskr.* **14.** 1333-1348. 1 table. [Numerous refs.] [English summary].

The article constitutes a critical analysis of the enormous literature, in the form of books, pamphlets and reports of experimental work and clinical experiences (both in man and animals) published during the last three decades on the BCG vaccine. B. especially criticizes the more or less amateur treatment of statistical data apparent in many of the works of earlier reporters and advocates of the merits and demerits of the vaccine and reaches the following conclusions :–

(1) Practically all bacteriologists now agree that BCG vaccine never produces progressive or fatal tuberculosis, even in the g. pig, which is the most susceptible of all experimental animals. In tests made, BCG vaccine did not produce any injurious or fatal effect, and thus, there is no reason why it should not be used as a vaccine in man. Instead of increasing in virulence, it is more likely that the culture will eventually lose its present immunizing power. (2) Of all the known vaccines against TB., BCG is unique in producing a considerable resistance to TB. infection. The intradermal mode of application has proved to be the most effective and is therefore recommended. (3) In all probability, the immunity produced lasts for a long time after the reaction to the tuberculin has changed from positive to negative. (4) Without abandoning the proven public hygienic measures, which, since 1900, have reduced the mortality of TB. in human beings by more than 50%, vaccination with BCG ought to be seriously considered as a further step in immunizing those individuals who have not yet become sensitive to tuberculin and who are exposed to infection from cases of open TB. BCG should be reserved for such individuals.—GUSTAV NAERLAND (OSLO).

I. NÈGRE, L. (1936). Etat actuel des recherches sur l'immunisation biochimique contre la tuberculose. [**Immunization against Tuberculosis by Means of Tubercle Bacillus Extracts**].—*Rev. Path. comp.* **36.** 1259-1268. [Numerous refs.]

II. MACHEBOEUF, M. A. (1936). Etat actuel des recherches sur l'immunisation biochimique contre la tuberculose. [**Immunization against TB. by Means of Tubercle Bacillus Extracts**].—*Ibid.* 1268-1276. [Numerous refs.]

I. A review of experiments upon the immunization of laboratory animals against TB. by the use of vaccines prepared from chemical extracts of the tubercle bacilli. The best results were obtained by the intravenous inoculation of a vaccine prepared by the extraction of the lipoid content of the bacilli with acetone for 48 hours, the extract being then treated with absolute methyl alcohol for 10 days. The inoculation of this vaccine does not produce an allergic condition in the experimental animal. Inoculated (subcut.) in repeated doses into tuberculous rabbits, it retards the progress of the disease and the animals may remain alive for several months after the death of the control rabbits.

II. A description of the preparation and application of a " chemovaccine " against TB. It is suggested that a vaccine prepared from dead bacilli contains certain substances which retard the establishment of an immunity. These substances are extracted from the fresh bacilli with acetone and ether at room temperature and the residue is used as a vaccine, which is said to cause the rapid production of antibodies, and to confer a marked resistance to TB.—E. C. HULSE.

NÈGRE, L., & BRETEY, J. (1937). Prémunition antituberculeuse du singe cynocéphale par les variétés lisses de bacilles tuberculeux. Rôle de la voie d'introduction des bacilles-vaccins et de la répétition des injections. [**Anti-Tuberculous Immunization in the Monkey by Inoculation of Smooth Strains of Tubercle Bacilli**].—*Ann. Inst. Pasteur.* **59.** 173-181. [6 refs.]

The immunization of a series of monkeys against TB. was attempted by means of a vaccine prepared from smooth colonies of a human strain of the organism which was known to produce only a benign infection in g. pigs and rabbits. The product was found to stimulate an immunity to a test dose of a strain of medium virulence when injected repeatedly (intraven.) and while repeated subcutaneous injections gave some resistance a single dose given in this way had little effect. —F. BLAKEMORE.

EGEHØJ, J. (1937). Mononukleose hos svin i tilslutning til infektion med rødsygebakterier. [**Mononuclear Leucocytosis in Pigs with Swine Erysipelas**].—*Skand. VetTidskr.* **27.** 333-354. 20 figs., 1 table. [Numerous refs.] [English summary].

E. gives a summary of the main changes in the blood picture which take place under infectious conditions, chiefly based on haematological studies made in human pathology, in which examinations of the blood play a much more important role in clinical work than in animal pathology.

Then he sets forth in tabular form his observations on the blood picture of pigs affected with S.E., concluding that :– (1) in moderate cases there is a neutrophile leucocytosis ; (2) in severe cases, on the other hand, leucopenia occurs, due to reduction mainly affecting the neutrophiles ; (3) in general S.E. is characterized by a marked mononuclear leucocytosis, the appearance of atypical large mononuclear lymphocytoid cells and toxic granulation of the neutrophile cells. From a haematological point of view, S.E. resembles *Listerella* infections, as the infectious agent in both has a marked lymphotrophic effect.—G. NAERLAND (OSLO).

MADSEN, D. E. (1937). **An Erysipelas Outbreak in Turkeys.**—*J. Amer. vet. med. Ass.* **91.** 206-208. [1 ref.]

The outbreak was in a lot of 1,300 birds, and resulted in the loss of 325, chiefly males. Two other lots of about the same size, running as separate flocks, were not affected. The outbreak subsided in four weeks and losses were heaviest in the first two weeks. *Erysipelothrix rhusiopathiae* was isolated from the turkeys and identified by cultural and pigeon-inoculation test.

It is thought that infection was washed down by rainstorms from a place about a mile away which had been used for lambing. No evidence, however, could be obtained that infection was present in the sheep.—W. J. IRONSIDE.

GUYAUX, R., & DEVOS, R. (1937). Pasteurellose porcine au Katanga. [**Porcine Pasteurellosis at Katanga**].—*Bull. agric. Congo belge.* **28.** 299-301.

In a herd of 50 pigs, three died at intervals of a few days. A young pig which had recently died was brought to the laboratory for examination. *Bact. coli* was isolated from the peritoneal and pericardial fluids and pasteurella organisms from the intestinal mucous membrane. The remaining pigs were given dead pasteurella vaccine followed six days later by living vaccine. No further mortality occurred and the authors concluded that the foregoing evidence associated with the P.M. appearances and absence of other contagious disease established a diagnosis of pasteurellosis.—S. J. GILBERT.

I. KOLAYLI, C., MAVRIDIS, N., & ARAYAJI, R. (1936). La durée de conservation de la virulence dans le sang du microbe du choléra des poules. [**The Period for which Fowl Cholera Blood is Virulent**].—*Rev. gén. Méd. vét.* **45.** 518-519.

II. VAN ES, L. (1937). **Fowl Cholera.**—*J. Amer. vet. med. Ass.* **90.** 446-450.

I. The authors found that fowl cholera blood kept in pipettes at ordinary temperatures (10°C.) apparently retained all its virulence for about 40 months.

II. A short general article on the disease, in which the author stresses the importance of the "carrier" bird in causing fresh epidemics or even single cases. The spread of the disease most commonly occurs by direct contact. The causal organism may frequently be isolated from the nasal mucus of survivors of an epidemic. Commercial vaccines and sera are considered to be useless. The so-called aggressins are considered harmful in that they send up the carrier rate. —D. L. HUGHES.

VAN DORSSEN, C. A. (1937). Haemophiele bacillen in inwendige organen van hoenders bij coryza gallinarum met korte incubatie. [**Haemophilus Bacilli in Fowls with Coryza**].—*Tijdschr. Diergeneesk.* **64.** 225-228. [3 refs.] [English, French and German summaries].

Judging from two experimental chronic cases of coryza of rapid onset, in which *Haemophilus coryzae* was isolated from the spleen (in one case also from a lung lesion), the author suggests that the symptoms of emaciation in chronic cases of coryza are probably due to generalization of the infection.—C. B. (SCHIEDAM).

FERK, S. (1937). B. influencae suis kod zdravih svinja u nas. [*Haemophilus influenzae suis* **in Healthy Pigs in Yugoslavia**].—*Vet. Arhiv.* **7.** 385-398. 1 fig. [13 refs.] [German summary].

An investigation was made of the presence of *H.i.s.* in 300 healthy pigs, aged between one and 18 months, killed at the Zagreb abattoir. The organism was found in 12 cases (4%), eight of the cultures isolated being recovered from the trachea or bronchi of very young animals.—B. OSWALD (SPLIT).

VON BUZNA, D. (1937). Versuche zum Nachweis des Bacterium suipestifer. [**Detection of** *Salmonella suipestifer*].—*Z. InfektKr. Haustiere.* **51.** 33-42. 1 fig., 2 tables. [4 refs.]

A selective method is described for the isolation of *S.s.* from faeces. The principle of the method depends on the ability of a motile organism to pass through

a resistant substance like sand or gelatin more easily than a non-motile organism. A layer of sterile sand is placed in the bottom of a U-tube and the two arms are filled with a bile-broth medium. When one column of medium is sown with a mixture of *S.s.* and *Bacterium coli* it is found that a pure culture of the former can be recovered from the medium in the other column after 10-11 hours' incubation, whereas *Bact. coli* may be found 2-3 hours later. When faeces are cultured the uninoculated column is usually tested for growth after 24 hours' incubation by sowing out on a solid medium. By the application of this method the author was able to isolate *S.s.* from the faeces of 22 per cent of pigs where cultural examination on Drigalski medium was negative. The author stresses the importance of a selective method for detecting carriers when an attempt is being made to eradicate paratyphoid.—S. J. EDWARDS.

I. GAUGER, H. C. (1937). **A Study of Naturally Infected Field Cases of Avian Typhoid.**—*Tech. Bull. N. C. agric. Exp. Sta.* No. 53. pp. 63. 8 figs., numerous tables. [14 refs.]

II. CHERRINGTON, V. A., GILDOW, E. M., & MOORE, P. (1937). **Paratyphoid in Turkeys.**—*Poult. Sci.* **16.** 226-231. 1 table. [9 refs.]

III. SCHALM, O. W. (1937). **Study of a Paratyphoid Infection in Chicks.**—*J. infect. Dis.* **61.** 2 tables. [7 refs.]

IV. SHIRLAW, J. F., & IYER, S. G. (1937). **A Note on a Variety of *Salmonella enteritidis* Isolated from Pigeons.**—*Indian J. vet. Sci.* **7.** 231-242. 2 figs. on 1 plate, 8 tables, 2 charts. [4 refs.]

I. A very detailed clinical and bacteriological study of seven fatal and eight carrier cases of *S. gallinarum* infection. *S.g.* could be recovered regularly from the blood stream during the period of high temperature, but rarely when the temperature was normal. It could be cultured from the faeces throughout the course of the disease and into the stage of convalescence. It was also isolated from the eyes, posterior nares and pharynx, and persisted in the latter site from a few days up to several months. The possibility of droplet infection and the oral contamination of the drinking water must, therefore, be borne in mind. *S.g.* was recovered from three eggs laid by carrier birds. However, in view of the rarity of the infection in chicks, G. does not consider that egg transmission is common. Whole blood and serum tube agglutination tests were positive (1 : 25 or above) up to 41 weeks after infection. A higher titre was obtained with *S.g.* than with *S. pullorum.*

Rough strains were obtained from some of the survivor and carrier birds, and appeared less virulent than the smooth strains isolated from fatal cases. The virulence test was on a very limited scale.

II. The authors describe *S. typhi-murium* infection in turkey flocks, which gave rise to a septicaemic disease of poults, the losses reaching 90%. Affected poults died rapidly up to the age of 10 days, weakness and diarrhoea being the common symptoms; there were no diagnostic symptoms or lesions. Some of the breeding turkey hens which had produced affected poults gave positive aggl. tests with *S.t.-m.* This organism was also isolated from three out of 30 dead in the shell poults, although it was not obtained from 23 infertile eggs from the same flock. The causative organism was isolated from the ovaries of two out of six turkey hens. Clean ten-week poults placed in contact with the affected poults also contracted the infection and died.

The usual sanitary measures appeared to be ineffective in controlling the disease.

III. The disease described in this article presented symptoms similar to those of pullorum disease. The causal organism had the morphological and biochemical characteristics of *S. typhi-murium*, but no antigenic analysis was undertaken. The findings suggested that the chicks became infected in the incubators after hatching. Certain batches of the chicks that had been exposed to faulty ventilation showed a higher incidence of the disease than those in other batches.

Eggs were painted with a mixture of sterilized chick faeces and broth cultures of the causal organism, and the chicks from such eggs became infected. It was found that the organism under these conditions survived for as long as 111 days.

Four-day-old chicks proved refractory to oral artificial infection, as did 63-day-old chicks to intravenous inoculation. The blood sera of the artificially inoculated chicks and survivors of the outbreak failed to agglutinate *S.t.-m.*

The outbreak was controlled by formaldehyde fumigation of the incubators.

IV. The authors describe an organism isolated from a batch of pigeons that had been inoculated with pigeon pox virus. This organism caused a bacteraemic disease. Morphologically and culturally it appeared to be *S.e.* It is suggested that the antigenic analysis supports this view ; its antigenic structure in terms of " H " and " O " was not determined.—D. L. HUGHES.

I. KRANTZ, C. (1936). Zum Vorkommen von Enteritisbakterien (Bact. enteritidis Gärtner und Bact. enteritidis breslaviense) in Wassertümpeln, Seen, Teichen und Bächen, auf denen Wassergeflügel gehalten wird. Ein Beitrag zur Aufklärung der Ursachen von bakteriellen Lebensmittelvergiftungen durch Wassergeflügel. [*Salmonella enteritidis* **in Duck Ponds and Lakes**].—*Inaug. Diss., Hanover.* pp. 56. [Numerous refs.]

II. BOECKER, E. (1937). Ergänzende Mitteilung zu meiner Arbeit " Die praktische Diagnostik der Bazillen der Typhus-Paratyphus-Enteritis-Gruppe " in Band 137, Seite 321 (1936) dieser Zeitschrift. [**Supplement to my Work on " The Diagnosis of Salmonella Infections " in** *Zlb. Bakt. I.* (*Orig.*). **137.** 321].—*Zlb. Bakt. I.* (*Orig.*). **139.** 167-169. [3 refs.]

III. SCHACH, W. (1937). Der Infektionsablauf bei künstlich mit Bacterium enteritidis Gärtner infizierten Rindern. [**Experimental** *S. enteritidis* **Infection of Cattle**].—*Berl. tierärztl. Wschr.* March 12th. 161-166. 5 figs., 5 tables.

IV. VAN DORSSEN, C. A. (1937). Salmonella typhi-murium-Infektionen bei Katzen und Kaninchen. [*S. typhi-murium* **in Cats and Rabbits**].—*Dtsch. tierärztl. Wschr.* **45.** 196-198. [Numerous refs.]

V. LÜTJE. (1937). Ueber Enteritiden beim Geflügel und eine spontane Uebertragung von Kälberenteritis auf Küken. [**Enteritis in Fowls and Transmission of Calf Paratyphoid to Chickens**].—*Ibid.* 242-245. 1 table.

I. Two hundred water samples, collected from 100 different sources of water which carry populations of water-fowl, were examined for *S. typhi-murium* but the organism was not found. [The difficulty of isolating salmonella after dilution in large volumes of water is well-known].

II. To overcome the difficulties resulting from the rapid transition of certain species of salmonella from the type-specific to the group phase, the use of mixed type and group antisera is recommended for diagnostic purposes. [See also *V. B.* **7.** 318].

III. An investigation of an outbreak of salmonella infection in bovines used for the preparation of foot and mouth disease antiserum. As a result of superinfection five animals died ; organisms were isolated from the lymph nodes which,

when tested against Gärtner, Breslau, *cholerae-suis* and *paratyphi* B antisera, gave highest agglutination titres with the anti-Gärtner serum. Five in-contact animals were later identified as excretors, *S. enteritidis* being isolated from their faeces. These animals were killed and in every case the organism was isolated from lymph nodes.

IV. A report of naturally occurring infection of young cats with *S. typhimurium*, presumably contracted from contaminated food. Cats not carrying infection showed no specific antibodies, but these developed after infection.

V. A discussion of the significance of salmonella infection of poultry with special reference to the distribution of organisms causing salmonella food poisoning by means of eggs. *S. enteriditis* infection of a flock of birds is reported, which was thought to have been derived from contact with infected calves.—E. J. P.

HENNING, M. W. (1937). **On the Variation of the Specific Phase of** *Salmonella amersfoort* **n. sp.**—*J. Hyg., Camb.* **37.** 561-570. 6 tables. [Numerous refs.]

H. has identified a new *Salmonella* from the fowl, the original culture being obtained from the heart blood of a seven-day-old chick. This organism has been named *S. amersfoort* after its place of origin. It conforms morphologically with other *Salmonella*, it is motile, and it gives the following biochemical reactions :– acid and gas are formed in glucose, maltose, mannite, dulcite, arabinose, rhamnose and sorbite ; hydrogen sulphide is produced ; litmus milk is made alkaline, and no indol is formed.

The organism's antigenic structure is peculiar. The somatic " O " antigen is identical with that of *S. potsdam* and, therefore, consists of factors VI and VII. Its " H " consists of two distinct phases, both of them specific. These phases are similar to those first described by KAUFFMANN and MITSUI (1930) as α and β variants. The α phase of this organism contains the factors enx of the " H " antigen of *S. abortus equi*, the β phase consists of factor d of the specific " H " antigen of *S. stanley* and *S. typhosum*.

Starting with single cell cultures it was found that both variants constantly appeared in the succeeding cultures. The organism apparently does not occur in the non-specific phase. The following antigenic structure is proposed for *S. amersfoort* :– somatic " O " antigen VI, VII ; flagellar " H " antigen (1) α phase of Kauffmann and Mitsui enx (2) β phase of Kauffmann and Mitsui d.—D. L. H.

GABBI, U., & CANTANI, A. (1933). Il comportamento delle bufale gravide di fronte ed alla Brucella abortus ed alla Brucella melitensis. Ricerche sperimentali. [**Brucella Infection in Buffaloes**].—*G. Clin. med.* **14.** 234-238.

The report of an experiment to compare the relative infectivity of *Br.a.* and *Br.m.* for buffaloes. It is concluded as a result of an investigation with very few animals that buffaloes are probably more susceptible to the *abortus* than to the *melitensis* infection. Artificial inoculation with *Br.a.* resulted in a transient bacteraemia, abortion occurred and the organism was reisolated from the amniotic fluid. Artificial inoculation with *Br.m.* stimulated a mild antibody reaction, but no bacteraemia followed. The susceptibility of this animal for brucella infection is of particular importance, because in certain parts of the world the buffalo is used for milk production.—E. J. PULLINGER.

MEUROU, P., & PINEAU, M. (1937). Brucellose à *Brucella abortus bovis atypique* chez la brebis. [*Br.a.* **in the Ewe**].—*Bull. Acad. vét. Fr.* **10.** 223-225. 1 table.

The authors have previously recorded typical bovine strains of *Br.a.* in

goats [*V. B.* **8.** 75]. They now report an atypical strain isolated from ewes. Abortions had occurred in the affected flock for three successive lambing periods, and live lambs produced by infected ewes usually died within a few days of birth. The agglutination titre of the blood serum of one out of three ewes which had aborted three times in succession was 1 : 640 and that of the milk whey of one was 1 : 1,280. Blood cultures from the latter ewe were negative, but the milk was pathogenic for a g. pig on two occasions. The g. pigs yielded similar atypical bovine strains of *Br.a.* which gave negative tests for H_2S production and would not grow on Petragnani's medium or in a 1 : 30,000 thionin blue medium, but produced positive growth on 1 : 25,000 fuchsin medium and on the usual brucella culture media. The cause of the outbreak was not due to any form of brucella vaccination and remained undetermined. A travelling ram may have introduced the disease to the flock in the first instance.—C. V. Watkins.

Topacio, T. (1937). **Brucella Infection (Infectious Abortion) of Swine in the Philippines.**—*Philipp. J. anim. Indust.* **4.** 175-187. 1 table. [12 refs.]

In two outbreaks of abortion in swine the porcine strain of *Brucella abortus* was isolated from aborted foetuses and from organ emulsions. Aborting sows showed a characteristic purulent metritis, and infected boars showed pronounced orchitis with abscess formation. The outbreaks were cleared up by eliminating reactors to agglutination tests.

The agglutination test was applied to 1,975 hog blood specimens collected in the Manila abattoir and 2·2% gave a positive reaction. The transmissibility to human beings is discussed.—E. E. Jelbart.

Olin, G. (1937). Undulant feberus epidemiologi och profylax. [**Undulant Fever**].—*Hygiea, Stockh.* **99.** 401-426. 7 figs., 3 tables. [Numerous refs.] [Copied *verbatim* from *Brit. med. J.* Aug. 21st. p. 29 of Epit. Current Med. Lit.]

G. Olin gives an account of the behaviour of undulant fever in Sweden, where it is caused only by *Brucella abortus, B. melitensis* and *B. suis* playing no important part in this country. The geographical distribution of the 1,121 cases of undulant fever notified in the period from 1929 to 1936 corresponded to that of infectious abortion in cattle, but while the latter exists in at least 10 per cent. of all the herds and serological tests have suggested that some 33 per cent. are infected, the incidence of undulant fever in man in the period under review was only 2·04 a year per 100,000 inhabitants. The comparative immunity enjoyed by man was traced by the author to the feebly pathogenic properties of *B. abortus* so far as human beings are concerned. Yet, when they fell ill, the average duration of the fever in 115 cases was over ninety-one days, varying from 8 to 532 days. The post-febrile period of convalescence was also long, being usually about three months. In all the illness commonly lasted six months, but a fatal issue occurred in only 2·2 per cent. of cases. The author considers that fully three-quarters of all the Swedish cases were due to milk infections and not to direct contact. He foresees in the extension of milk pasteurization the most effective preventive of undulant fever. Of the benefits of prophylactic inoculation he is more doubtful, although it may be advisable for those who are especially exposed to contact infections. His skin tests on 293 persons with an antigen have convinced him that a good proportion of the community undergo infection unwittingly and without any noticeable clinical reaction.

Cummings, G. D. (1936). **Tentative Methods for the Recognition of the Brucella Group of Organisms and Other Biological Procedures as They Relate to**

the Diagnosis of Undulant Fever.—*Yearb. Amer. publ. Hlth Ass. 1935-1936.* pp. 193-199.

The actual technique for the procedures recommended for the diagnosis of brucella infection and brucella contamination is recorded and includes :– (1) blood culture using both citrated and inactivated blood ; (2) urine, faeces, and milk culture ; (3) g. pig inoculation ; (4) agglutination tests by slow tube and rapid slide methods, and milk whey tests [the method of preparing the antigen is recorded in each case] ; (5) dye resistance tests, including preparation of the dye media ; (6) allergic tests, including preparation of abortin, and (7) the opsono-cytophagic test.—E. J. PULLINGER.

RAMON, G. (1936). L'anatoxine tétanique et la prophylaxie du tétanos chez l'homme et chez les animaux domestiques. [**Tetanus Anatoxin and Prophylaxis against Tetanus in Man and Domestic Animals**].—*Pr. méd.* Oct. 17th. 1625-1628. 1 table. [Numerous refs.]

A résumé of the research on anatoxins during the last 12 years. Tetanus anatoxin was found capable of conferring rapidly a strong immunity on horses after two 10 c.c. doses with an interval of one month between them. The addition of tapioca or calcium chloride was found to enhance the immunity, and antiserum of very high potency was produced by such treatment if it was followed by a third injection some time after vaccination. Of 35,000 horses vaccinated (3 doses) in the course of veterinary practice, not one contracted tetanus, although it has continued to appear in similarly situated unvaccinated horses.—J. E.

WEINBERG, M., ARMINGAUD, ROUSVAL, & KREGUER. (1937). Gangrène gazeuse du part chez la vache. [**Parturient Gas Gangrene in the Cow**].—*Bull. Acad. vét. Fr.* **10.** 210-215 and 218-221. [3 refs.]

A cow was given antigangrene serum after difficult delivery, but died four days later with gas gangrene of the vagina and vulva.

Cultures from the vagina showed the presence of streptococci and proteus, while anaerobically *Clostridium oedematiens*, *Cl. tertium*, and *Cl. bifermentans* were grown. Cultures from fragments of the vulva revealed the presence of streptococci and of Proteus and the following anaerobes :– *Cl. oedematiens*, *Cl. tetanomorphum*, *Diplococcus magnus*, a very toxic strain of *Cl. septique*, and a very toxic strain of *Cl. welchii* type A.—H. H. HOLMAN.

DALOUS, E., FABRE, J., PONS, H., & CAHUZAC, M. (1937). Réalisation expérimentale de l'hépatite bulleuse à *Bacillus perfringens* chez le lapin. [**Experimental Hepatitis in Rabbits Caused by** *Clostridium welchii*].—*Ann. Inst. Pasteur.* **59.** 329-340. 5 figs.

The authors point out that " spongy liver " in human beings due to *Cl. w.* infection occurs almost exclusively as a septicaemic condition following septic abortions, but that, it has not been previously produced in experimental animals, owing to the fact that the animals die rapidly of general or local gas gangrene after infection.

The authors describe the lesions in rabbits, which are relatively resistant to infection, following injections (intramusc. and intraven.) with strains of *Cl.w.* of varying virulence, and, finally, describe the production of gaseous lesions in the liver of one rabbit, by exposing a loop of intestine and injecting *Cl.w.* into the lumen of a mesenteric vein taking every precaution to avoid depositing the organisms elsewhere during the injection. The rabbit was killed 36 hours later, at the agonal stage before death. Infection of the liver had occurred similar to that referred to above (spongy liver).—C. V. WATKINS.

LINK, T. (1937). Wann sind intrakutan eingespritzte Bakterien in inneren Organen nachweisbar? [**The Demonstration of Bacteria in the Internal Organs after Intracutaneous Injection**].—*Zlb. Bakt. I.* (*Orig.*). **139.** 489-492. 4 tables. [5 refs.]

Bacterium coli, *Bacillus anthracis*, *Salmonella typhi*, *S. enteritidis* and *Streptococcus pneumoniae* (Type 8) could be isolated from the spleen of mice half an hour to three hours after the organism had been inoculated intradermally.—E. J. P.

POENARU, I. D. (1937). Les mycétomes actinomycosiques chez le chat. [**Actinomycosis in the Cat**].—*Arhiva Vet.* **29.** No. 1. 1-4. 3 figs. [In French].

A description is given of cutaneous granulomata in the cat, from which a streptothrix was isolated. Subcutaneous inoculation of cultures into cats resulted in typical lesions in a small proportion of cases. The administration of potassium iodide was efficacious in treatment.—E. W. ASCOLI.

LEMIERRE, A., REILLY, J., LAPORTE, A., & MORIN, M. (1937). Sur une nouvelle fièvre par morsure de rat. [**A New Type of Rat-Bite Fever**].—*Bull. Acad. Méd. Paris.* **117.** 705-713. [Numerous refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 710. Signed G. S. WILSON].

A case is described of a febrile illness in a man of forty years of age coming on four days after a bite by a rat. The fever was of the intermittent quotidian type. It lasted for six weeks, and was cut short by a violent shock following the intravenous injection of colloidal silver. A few days after the onset severe articular pains appeared, affecting nearly all the joints, but being particularly bad in the left elbow and wrist. Other symptoms included a sore throat that rendered swallowing painful and marked emaciation. Both the pharynx and larynx were inflamed. No skin eruption occurred. The leucocytes in the blood numbered 14,000-24,000 per cmm., the polymorphs comprising 80 per cent. Blood culture on the 29th day of the illness yielded a growth of *Streptobacillus moniliformis*. [The use of the term " new " in the title is hardly justified. More than twenty years ago German and American workers described a type of rat-bite fever due to an Actinomyces-like organism that was almost certainly *Streptobacillus moniliformis*.]

DAVIS, C. L., STILES, G. W., Jr., & MCGREGOR, A. N. (1937). **Pulmonary Coccidioidal Granuloma. A New Site of Infection in Cattle.**—*J. Amer. vet. med. Ass.* **91.** 209-215. 6 figs. [6 refs.]

The authors state that 21 cases of this disease in cattle and one in a sheep have already been recorded, all, except two cases in cattle, having been found in California. The disease in man [caused by the same parasite] often becomes generalized; in animals it is confined to the bronchial and mediastinal lymph nodes. Forty-seven additional cases in cattle are reported; pulmonary lesions have been found for the first time. Of these, 42 cases occurred in a lot of 128 cattle about six years old slaughtered in Los Angeles. Some of the lymph nodes contained creamy tenacious pus resembling actinomycotic pus [presumably the authors mean the pus seen in actinobacillosis]; the lesions in the lymph nodes and lungs were caseous, resembling the caseous lesions of TB. Five more cases were found in a lot of 61 cows about six years old slaughtered at the abattoirs in Los Angeles.

The organisms were found in cover-slip preparations of the pus; they were spherical bodies with a refractile double contoured capsule, varying in size from 10-50μ, Gram-negative and stained well with eosin. Cultures of the pus on

nutrient agar after 72 hours at 37°C. yielded pure growths of *Coccidioides immitis*. The colonies were white and cotton-like and were composed of an intricate network of mycelia. The histological appearances of the lesions in the lymph nodes and lung are described. The authors refer to the so-called " skin-lesions " in bovine tuberculin reactors and suggest that *C.i.* might be found in such lesions in Californian cattle.—C. McGaughey.

Davidson, A. M., & Gregory, P. H. (1937). **The Dermatophytes of Manitoba (Canada).**—*9th Congr. internat. Dermat., Budapest.* **1.** 7. 9 figs. [Abst. from abst. in *Bull. Inst. Pasteur.* **35.** 394].

It is stated that *Microsporon felineum*, *Trichophyton gypseum* and *Tr. album* are the common causes of ringworm in animals in Manitoba. They are transmissible to and from man.

Grigoraki, L. (1936). L'aleurie: ses formes et sa définition. [**The Aleuriospore: Its Formation and Definition**].—*Rev. mycol.* **1.** 37-39. 6 text figs. [5 refs.] [Copied *verbatim* from *Rev. appl. Mycol.* **15.** 608.]

The author defines aleuriospores as uninucleate spores of variable size resulting from the complete or partial dissociation of the protoplasm of a hypha or sporophore. They may be internal or external, and are classified into four kinds, aleurioblastospores, aleuriochlamydospores, aleurioconidia, and micraleuriospores. The first kind are budded off from the mycelium-like yeasts; the second are pleomorphic, broadly pedicellate when external, and resemble small chlamydospores; the third are of constant size, borne on distinct sporophores, and resemble conidia at first but have no distinct pedicel; the fourth kind are generally formed internally, and are liberated by the rupture of a hypha, as in *Actinomyces*.

Spore forms which may be confused with aleuriospores are arthrospores, entospores (a vague term applied by Vuillemin to various forms) conidia, and chlamydospores. Arthrospores are poly- or uninucleate spores formed by the cutting-off of portions of the thallus, conidia are external, uninucleate spores without glucogen reserves, shed without destroying the mycelium, and chlamydospores are always internal, polynucleate, thick-walled, and variable in size.

Catanei, A. (1936). Les caractères de la résistance acquise dans les mycoses. (Immunité ou prémunition). [**Acquired Resistance in Mycoses**].—*Arch. Inst. Pasteur Algér.* **14.** 85-101.

This review is concerned chiefly with human mycoses. In most mycoses, an allergic state develops, demonstrable by intradermal or subcutaneous injection of the appropriate antigen.

Susceptibility to reinfection during and after the initial infection varies. In most cases a state of partial immunity develops, and in some an absolute immunity. In equine epizootic lymphangitis, the inoculation of pus or culture containing virulent cryptococcus is usually followed by a localized, rapidly healing abscess, or by no reaction at all.—E. W. Ascoli.

DISEASES CAUSED BY PROTOZOAN PARASITES.

Rajagopalan, V. R. (1937). **The Incidence and Control of Trypanosomiasis among Domesticated Animals in India.**—*Agric. Live-Stk India.* **7.** 469-478. 1 text fig., 7 figs. on 3 plates.

A popular article for farmers.—E. E. Jelbart.

KOFFMAN, M. (1937). Flagellatförekomsten vid kastning hos nötkreatur. (Sweden). [**Bovine Abortion and Flagellates (Genus *Bodo*)**].—*Skand. VetTidskr.* **27.** 310-324. 7 figs., 2 tables. [English summary].

Of about 60 samples of material examined from cows that had aborted, three proved to harbour flagellates. The measurements varied from 8-12μ in length and 4-5μ in breadth. Having neither undulated membrane, nor axostyle but two free flagella, the organisms could not belong to the genus *Trichomonas*, but were considered to belong to the genus *Bodo*. The name *Bodo foetus* is accordingly proposed. The flagellates lived in cold storage for over two weeks, but were dead after two days in an incubator at 37°C. Several media for artificial growth were tried, and the best was found to be physiological saline solution to which small pieces of foetal tissue were added. The optimal temperature for artificial growth was about 20°C. at a pH of 7·0. As growth goes on, the pH tends to rise, and the use of a buffer solution is recommended.

[It does not appear from the paper whether the flagellate here described was suspected to have caused abortion in the three cases reported, or not]. Inoculation experiments on in-calf cows have not yet been undertaken, but are planned. The report is a preliminary one.—GUSTAV NAERLAND (OSLO).

YAKIMOFF, W. L., & MATSCHOULSKY, S. N. (1937). Abnorme Coccidienformen. [**Abnormal Forms of Coccidia**].—*Arch. Protistenk.* **88.** 440-444. 6 figs. [7 refs.]

The observations described in this paper were made during investigations into the coccidia of the ox, sheep and camel. They are chiefly concerned with abnormalities in shape of oocysts, absence of micropyle, etc. For example, the first case described is that of the oocysts of *Eimeria smithi* from the ox, which are normally egg-shaped with a micropyle at the tapering end ; the abnormal oocyst was oval in form without any pronounced difference between the two polar ends [the authors seem satisfied that it was not an oocyst of *E. ellipsoidalis*] and the absence of a micropyle in the figured oocyst is noteworthy. [Abnormalities of shape are not rare in other species].—C. HORTON-SMITH.

RODHAIN, J. (1936). Piroplasmes d'okapi et d'éléphants dans l'Ouelle. [**Piroplasms of Okapi and Elephants in Ubangui District, Belgian Congo**].—*Bull. Soc. Path. exot.* **29.** 877-881. 11 figs. [9 refs.]

R. records the detection of forms resembling *Theileria mutans* in the red blood corpuscles of three okapi within two months of their capture, and suggests that infection had been acquired in the Rubi forest [see also *V. B.* **6.** 763].

He also records the detection of piroplasms in the blood of a young elephant about three weeks old. This organism was characterized by its irregular amoeboid shape and the occurrence of Maltese cross forms, and appeared to resemble closely the piroplasms recorded from rodents. The name *Nuttallia loxodontis* is suggested. The elephant was infested with *Amblyomma tholloni* and *Dermacentor circumgultatus*.—U. F. RICHARDSON.

FOTHERINGHAM, W., & LEWIS, E. A. (1937). **East Coast Fever ; Its Transmission by Ticks in Kenya Colony. *Hyalomma impressum* near *Planum* P. Sch as a Vector.**—*Parasitology.* **29.** 504-523. [Numerous refs.]

The authors review previous knowledge as to the vectors of *Theileria parva*, and refer to peculiar forms of disease due to this organism which may prove to be occurring in sporadic areas. Investigation of the vectors and of the disease produced by different species of ticks was undertaken as a possible means of eluci-

dating some of the problems encountered in the study of the infection. The ticks used in the experiments were reared in the laboratory, and the cattle used in transmission experiments were either reared under tick-free conditions or obtained from farms free from E.C.F., although they were not always free from other tick-borne parasites.

Transmission by nymphs and adults of *Rhipicephalus appendiculatus* and adults of *R. evertsi* and *R. simus* is confirmed. Experiments with *R. sanguineus*, *R. pulchellus* and *Amblyomma variegatum* were negative. Infective nymphs of *R. appendiculatus* remain infective after being subjected to 4°-6°C. and 8°-10°C. for 1, 2, and 3 weeks. Exposure to alternating temperatures for similar periods had no effect on the virulence of the parasite. *H. impressum* near *planum* P. Sch. was found capable of transmitting E.C.F. in the nymphal and the adult stages after the larvae and nymphs respectively have fed on an infected animal. The parasite does not pass through the egg.—S. J. Gilbert.

I. Sergent, E., Donatien, A., Parrot, L., & Lestoquard, F. (1936). Cycle évolutif de Theileria dispar du boeuf chez la tique Hyalomma mauritanicum. [**Developmental Cycle of** *Th. dispar* **in** *H. mauritanicum*].—*Arch. Inst. Pasteur Algér.* **14.** 259-294. 10 text figs., 1 plate, 1 table. [Numerous refs.]

II. Delpy, L. (1937). Les theilérioses bovines en Iran. [**Bovine Theileriases in Iran**].—*Ibid.* **15.** 225-264. 5 figs. on 2 plates, 7 tables, 4 graphs. [Numerous refs.]

III. Sprinholz-Schmidt, A. I. (1937). A propos de l'infection intra-utérine des bovidés par *Theileria sergenti* Yakimoff et Dekhtereff 1930. [**Intra-Uterine Infection of Cattle by** *Th. sergenti*].—*Ann. Parasit. hum. comp.* **15.** 381-382. [6 refs.]

I. *H.m.* is the sole vector of *Th.d.* in Algeria and does not convey any other form of piroplasm. It is normally a two-host tick. Infection takes place in the larva-nymph stage and evolution in the tick proceeds during some eight months' hibernation. Ticks in the larva-nymph stage were fed on two heavily infected cattle. The following stages were found to occur :– (a) gametocytes in the intestine of the nymph for some days following the ingestion of blood, (b) young zygotes, at first free and then intracellular in the intestine from the 13th to the 21st day, (c) zygotes encysted in the intestinal lumen throughout the period of hibernation, and (d) sporonts and sporozoites in the salivary glands at the time of the nymphal moult and in the adult when feeding on cattle. The article describes the evolution in detail with numerous measurements and illustrations. Control ticks fed on non-infected animals were used for comparison. A tick infected in the larval stage and fed on a clean calf immediately after having moulted to nymph did not convey the disease, but after hibernating in the laboratory conveyed infection 10 months later. Ticks fed in the larval stage did not infect other cattle as nymphs, unless sufficient time was given for evolution to take place, and if infected nymphs were fed they did not infect as adults, the salivary glands having apparently been emptied of sporozoites. The adult tick transmits the sporozoites to cattle only after having been fixed for three days on the animal.

II. D. concludes that two types of theileria exist in Iran, *viz* a non-pathogenic type (*Th. mutans*) and a pathogenic type allied to *Th. annulata* which he considers identical with *Th. dispar*. Only one case of acute theileria infection has been observed in native cattle. Blood from this animal was inoculated into two native calves, but no reaction followed. All calves were, however, carriers of a theileria which is morphologically distinct from *Th. mutans*, but the latter is also present to a small extent. All previous attempts to produce acute attacks in such animals

by lowering their resistance had failed. This experiment is considered a proof that the theileria already present in the blood of the calves is not (or is not only) *Th. mutans* as they were in a state of premunition to a pathogenic type of theileria. Nearly all native cattle in Iran show theileria in the blood.

Sixteen cattle were imported from France and were brought overland from Beirut. Owing to conditions of travel, they were necessarily exposed to tick infection *en route*. On arrival at Teheran they were all found to be tick infested and blood examinations made next day showed all to be infected with theileria. Their first possible exposure had occurred 15 days before. Twelve of these animals succumbed at periods varying from 21 to 57 days after exposure to infection. The infection had, therefore, taken place in Iraq. Symptoms and P.M. appearances are described and it is noted that the spleens were not enlarged and infarcts were not found in the kidneys.

The animals were treated with " gonacrine ", but without appreciable result. Blood from sick animals was inoculated into native calves of the type previously used ; the results were negative except for some rise in the percentage of red cells infected with theileria. It is concluded that the theileria of Iraq and Iran are identical.

Five Russian cattle were imported and were already infected with theileria of the Caucasus. Four of these showed acute attacks 11 to 49 days after possible reinfection in Iran and one died. The fifth animal was inoculated seven weeks after arrival and passed through an acute attack. The percentage of red cells infected was generally lower than in the case of the French cattle. Experiments were also made at the Institut Pasteur of Algeria with *Hyalomma* sent from Iran. A mortality of 30% occurred during experiments on a number of susceptible calves and the organism was identified as *Th. dispar*.

In discussing morphology, D. considers that studies of the form of the parasites are misleading owing to constant change but that the chromatin does not vary, and that *Th. mutans* is characterized by elongated, or rod-like chromatin, *Th. parva* by ovoid chromatin, and that in *Th. dispar-annulata* it is punctiform. The vector in Iran belongs to the genus *Hyalomma* ; it is considered premature to decide on the species responsible as some confusion exists at present concerning classification.

III. A cow nearly due to calve was found to be infected with *Th. sergenti*. After three days abortion occurred and an examination was made of the blood of the foetus, taken from the jugular vein. 2% of the red cells were infected. 60% of the theileria were round or oval and 40% bacillary. Although YAKIMOFF and DEHKTEREFF (1930) described *Th. sergenti* as characterized by 19·7% and 78·9% of these forms respectively, the author has observed in a typical case of theileriasis a relationship similar to that observed in the foetus and, therefore, records the possibility of intra-uterine infection with *Th. sergenti*.—S. J. GILBERT.

I. DONATIEN, A., & LESTOQUARD, F. (1937). Particularités des *Rickettsia* des monocytes. [**Characteristics of Rickettsia of Monocytes**].—*Bull. Acad. vét. Fr.* **10.** 183-187. 2 figs.

II. DONATIEN, A., & LESTOQUARD, F. (1937). Existence de *Rickettsia conjonctivae* du boeuf en Algérie. [*Rickettsia conjunctivae* **in Cattle in Algeria**].—*Bull. Soc. Path. exot.* **30.** 451-452.

III. DONATIEN, A., & LESTOQUARD, F. (1937). État actuel des connaissances sur les rickettsioses animales. [**Animal Rickettsia Infections**].—*Arch. Inst. Pasteur Algér.* **15.** 142-187. 9 text figs., 14 figs. on 6 plates. [Numerous refs.]

IV. PARROT, G. (1937). Les rickettsioses confèrent-elles l'immunité vraie ou

la prémunition ? [**Does Rickettsiasis Confer True Immunity or Premunition ?**].—*Ibid.* 188-213. [Numerous refs.]

I, II & III. These papers deal with infections in Algeria with recently described species of rickettsia, the first and second articles being brief notes and the third a comprehensive study which also reviews the literature dealing with rickettsial infections in animals.

The rickettsia are described as minute polymorphic protistae, occurring in masses, and morphologically resembling bacteria except that they stain poorly by the ordinary bacterial dyes, and are best stained by Giemsa or May-Grünwald-Giemsa. They are non-motile, and may or may not be filter-passers. In vertebrates they are exclusively intracellular parasites occurring in epithelial or endothelial cells, or in monocytes. Except for the species associated with human and animal conjunctivitis, rickettsia are transmitted by arthropods in which they may be intracellular or free. In some species the arthropod infection is passed through the egg, in others only through a single moult. They are not culturable in ordinary media, and it is suggested that they are more closely related to protoza than to bacteria. The authors divide the organisms into three groups for purposes of classification. (1) Parasites of epithelial cells (*R. conjunctivae*). (2) Parasites of the reticulo-endothelial system, divided into :– (a) parasites of endothelial cells (*R. ruminantium*, *R. avium*), and (b) parasites of monocytes *R. canis*, *R. ovina*, *R. bovis*).

The diseases associated with the earlier described parasites are discussed, and it is suggested that *R. avium* may be synonymous with *R. psittaci.*

They then turn to the rickettsial infections of monocytes seen in Algeria, and which are characterized by the agglomeration of the parasites into masses that occur as cytoplasmic inclusions in monocytes, and are particularly numerous in smears made from the lungs, liver and meningeal capillaries. These rickettsial inclusions stain lilac with May-Grünwald-Giemsa stain, in contrast to the nucleus (red purple), the cytoplasm (blue) and azurphil granules (red). They persist in recovered animals, and *R. bovis* was detected in an ox 10 months after infection. *R. canis* was encountered in 60 dogs in Algeria and in lung smears from dogs from Marseilles and Montpellier in France. It is commonly associated with *Hepatozoon canis* and appears to be transmitted by the tick *Rhipicephalus sanguineus.* Infected dogs in Algeria exhibited fever, emaciation and a petechial skin rash, and although the mortality rate is known, it is stated that, in imported dogs, more died than recovered. The disease is transmissible by inoculation of blood or lung material to dogs and monkeys (*Macacus inuus*). *R. bovis* was detected in Algerian cattle which had been used to feed ticks of a species of *Hyalomma* sent from Iran. The infection could be transmitted by the inoculation of blood, and caused a temperature reaction which was not accompanied by clinical symptoms. *R. ovina* was encountered in sheep infected with *Babesia ovis*, appeared to be transmitted by *Rhipicephalus bursa*, and was not thought to cause serious disease. [Inclusion bodies occurring in monocytes in smears from the lungs of dogs have been previously described under the name *Pneumocystis carinii*, and had been assumed to be the schizont form of a haemogregarine].

IV. P. discusses " premunition " and points out that it is a state in which clinical recovery precedes microbiological recovery, and in which the persistence of the parasite protects the host against superinfection. Variability in the period of immunity to reinfection also characterizes infections leading to " premunition ". Persistence of the parasite after clinical recovery may be detected by subinoculation, splenectomy or capacity to infect the appropriate invertebrate carrier. This state is characteristic of protozoan infections. P. then reviews the evidence as to the

persistence of rickettsia after clinical recovery, and points out that *R. canis* can survive for at least 37 days in the dog and 158 days in monkeys, and that splenectomy causes a relapse accompanied by fever and the reappearance of the parasite.

R. ovina is directly detectable for 28 days and splenectomy of recovered animals causes a relapse. *R. bovis* persists for 10 months, and infection with *R. ruminantium* provokes a relapse. *R. ruminantium* can be demonstrated in the blood for 35 days after recovery by subinoculation, and has been demonstrated in endothelial cells 105 days after recovery, whilst the immunity conferred by recovery is not solid. In trench fever, lice have become infective after feeding on an individual three months after recovery. In swamp fever of Japan, although the virus is said to disappear from the blood, relapses occur, and the rodents which act as carriers of the disease probably retain a persistent infection. In " boutonneuse " fever and Rocky Mountain fever the evidence of virus persistence in man is not conclusive, but the viruses may persist in the reservoir hosts. In murine typhus the virus can be detected in the brains of rats up to 96 days, and the subsequent immunity exhibits the characteristic of variability. In exanthematous typhus the blood of one subject infected a g. pig after six months, and ZINSSER has suggested that the cases which occur amongst Eastern Europeans in New York are in reality relapses to an infection acquired in Europe. If this theory is accepted, it offers an explanation of how the typhus virus survives from one epidemic to the next; cold, hunger, etc., may bring the virus into the peripheral blood allowing of the infection of lice, and this may explain the association of the disease with war and famine.—U. F. RICHARDSON.

MARKHAM, F. S. (1937). **Spontaneous Toxoplasma Encephalitis in the Guinea Pig.**—*Amer. J. Hyg.* **26.** 193-196. 16 figs. on 1 plate. [5 refs.]

M. describes spontaneous infection in g. pigs a few weeks old in which marked paralytic symptoms, chiefly spastic in type, appeared abruptly and caused prostration in a few hours. No temperature reaction occurred. Histological examination of the brain and spinal cord showed a few scattered cyst-like structures in the cortex with no surrounding inflammation. The cysts were 15-30μ in diameter and were completely filled with minute bacillary forms containing chromatin.

Experimental transmission (intracereb.) of the bacteriologically sterile brain tissue from one of these g. pigs caused a temperature reaction in another g. pig on the sixth day and death on the ninth day with symptoms of encephalitis. There was a marked meningo-encephalitis with mononuclear leucocytes " cuffing " the congested blood vessels and an absence of neutrophiles. Similarly staining organisms to those found in the brain of the spontaneously affected g. pig were present in the macrophages and also free in the meningeal exudate. They varied from 3-6μ in length and from 3-3·5μ in width. Oval and crescent forms with rounded ends were observed, the chromatin being either in the form of a rounded nucleus, with or without a halo, or as a central band.

Similar protozoan cysts were observed in the kidneys of five out of 64 adult g. pigs. M. thereby hints at a spread of the disease in g. pigs through infective urine, and quotes cannibalism as a possible explanation of the spread of the disease in mice in which it also occurs.

The importance of the disease lies in its differentiation from various virus, rickettsia and bacterial diseases, in all of which the symptoms shown by g. pigs may be similar.—C. V. WATKINS.

BRUMPT, E. (1936). Etude expérimentale du *Plasmodium gallinaceum* parasite de la poule domestique. Transmission de ce germe par *Stegomyia fasciata* et

Stegomyia albopicta. [**Transmission of** *P.g.* **by** *S.f.* **and** *S.a.*].—*Ann. Parasit. hum. comp.* **14.** 597-620. 10 figs., 2 tables. [13 refs.]

B. succeeded in passaging a strain of *Plasmodium gallinaceum*, obtained from Ceylon, 23 times through common fowls. The mosquitoes *S.f.* and *S.a.* transmitted the infection, but not *Culex fatigans* or *C. pipiens*.

Common fowls, geese and pheasants contracted a fatal disease in which over 80% of the erythrocytes were sometimes parasitized. Turkeys, partridges and peafowls developed slight or transitory infections. Ducks, guinea-fowls, pigeons, turtle-doves, quails, buzzards, canaries, common sparrows, "calfats" (*Padda oryzivora*), chaffinches and a Moroccan species of heron all proved refractory to experimental infection.

There was an incubation period in common fowls of 5-10 days after intraperitoneal injection of blood, and then a period of acute parasitism lasting 7-27 days. No temperature reaction occurred. Recovery produced a very solid state of premunition against both the inoculation of infective blood and the "bites" of infective mosquitoes. Splenectomy sometimes caused a relapse which was a rare sequel to recovery, but the injection of adrenalin was without such effect. (*Cf. P. relictum* infection in the grey partridge). The spleen of birds which had died was enlarged and deep red or almost black in colour.

The various stages of the parasites in birds and mosquitoes are well illustrated. In gross infections in mosquitoes many of the smaller oocysts may show degeneration in the form of grains of pigment as a result of the overcrowding. Pappenheim's panoptic stain colours the female gametocytes a distinct blue, but male gametocytes are rose-coloured and contain grains of pigment throughout their cytoplasm. Parasitized erythrocytes have a feebly-staining cytoplasm and a displaced nucleus which shows compact chromatin unlike the normal network arrangement. In rare cases the nucleus is eliminated from the cell. Full details of all the experimental transmissions are tabulated.

B. suggests that the epidemiology of avian malaria indicates that the fowl is an accidental host of these parasites. The disease is probably confined to Ceylon, Sumatra and Annam because, although the two species of mosquitoes acting as vectors are cosmopolitan in their distribution, the poultry produced are not exported, but consumed locally.—C. V. Watkins.

Roos, C. J., Walch-Sorgdrager, B., & Schüffner, W. A. P. (1937). Een epidemie van *L. canicola*-infectie bij menschen en honden. [**An Outbreak of** *Leptospira canicola* **Infection in Human Beings and Dogs**].—*Ned. Tijdschr. Geneesk.* **81.** 3324-3325. 1 fig. [French summary]. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 777. Signed W. F. Harvey].

A patient admitted to hospital with the diagnosis of meningitis proved to be suffering from an infection with *Leptospira canicola*. This is the second case of meningitis due to the same cause, and the causation was established both serologically and bacteriologically. The history of the case was one of sudden onset with severe pain in the back and head and a temperature of 38°C. There was no jaundice and no conjunctival injection. The patient lay with knees drawn up and head retracted. Kernig's sign was present. A lumbar puncture gave a slightly turbid fluid, which contained 99 cells per c.c., mostly polymorph leucocytes. It was sterile on culture and no acid-fast bacilli were found. Recovery was rapid after admission to hospital on the eighth day of illness.

An enquiry was made into the probable source of infection and this led to the incrimination of a family of Samoyed dogs. All of these were found by serum reactions, discovery of spirochaetes in the urine, and injection of guineapigs to be

suffering from *Leptospira* infection. The sera of two contact human beings were found to react to *L. canicola* and a history was obtained of their having had influenza-like symptoms. In the case of the dogs the course of the infection was probably from the father to the mother of the litter, and from her to the puppies and from them to the three persons and another dog. A strain of the infecting organism was obtained from the urine of one of the patients and of four of the dogs. It proved more than usually virulent for guineapigs and this may account for so many human beings having been infected by contact. None of the dogs died, nor was any of the nine animals obviously sick. The suggestion is brought forward that *canicola* infection may possibly be commoner in dogs than has been realized and that it may often be a very mild disease.

DISEASES CAUSED BY VIRUSES.

—. (1937). **Foot and Mouth Disease. Outbreaks Past and Present. Search for a Remedy. I. Science and the Virus. II. The Policy of Slaughter. III. The Present Outbreak. IV. What it Means to the Farmer.** [ROBINSON, H. G.] **V. A General Summing-up.** [HOBDAY, F.].—*Ctry Life, Lond.* **82.** 621-626. 6 figs., 2 maps.

I. A general discussion on the scientific aspect of F. & M. disease written for the layman: the importance of the plurality of type of the virus is stressed. The work of the Foot and Mouth Disease Research Committee, Great Britain, is briefly reviewed.

II. The slaughter policy of the Ministry of Agriculture is defined. A historical survey gives the statistics from the time when the disease was first recognized in England (1839) until the present day; these figures furnish ample justification for the slaughter policy. The procedure of disinfection of infected premises is briefly described and the method of applying the official "standstill" order is explained.

III. A brief description is given of the recent outbreak, and the position of the various centres is indicated. Statistics of the continental outbreaks during 1937 are given. Evidence in support of the bird migration theory is produced and supported by reference to two maps which show respectively the position of the outbreaks and the autumn migration of birds.

IV. A discussion on F. & M. disease from the farmer's point of view. The slaughter policy is considered to be in the best interests of agriculture as a whole. The far-reaching effects of uncontrolled F. & M. disease outbreaks, such as the reduction in milk yield, abortion, etc., are clearly indicated. The opinion is expressed that stricter control measures might be enforced; the risk of importation of rye and flour products from countries where the disease is endemic is pointed out. It is suggested that the tyres of cars returning from continental tours might be sprayed with disinfectant on being unshipped.

V. H. reviews the whole question of F. & M. disease in this country both from the veterinary and the economic aspects. A comparative table gives the number of outbreaks reported each month in this country and in neighbouring continental countries during an average year; the number of outbreaks in Great Britain is seen to be very small compared with those occurring on the continent.

—E. C. HULSE.

I. SCHMIDT, S. (1936). Maul- und Klauenseuche-Immunität bei aktiv immunisierten Meerschweinchen. [**Immunity in Guinea Pigs Actively**

Immunized Against Foot and Mouth Disease].—*Z. Hyg. InfektKr.* **119.** 56-64. 9 tables. [6 refs.]

II. BUB, H. (1936). Einfluss des Immunserums auf die aktive Immunisierung gegen Maul- und Klauenseuche mit Formolvakzine. [**Influence of Immune Serum on Active Immunization against Foot and Mouth Disease by Formol Vaccine**].—*Inaug. Diss., Hanover.* pp. 18. 6 tables. [Numerous refs.]

III. MOINE. (1937). De l'emploi du sérum anti-aphteux au cours d'une épizootie. La séro-contamination, moyen général de prévention contre la fièvre aphteuse. [**"Sero-Contamination" (Serum Plus Exposure to Natural Infection) in the Control of Foot and Mouth Disease**].—*Rec. Méd. vét.* **113.** 395-404. [8 refs.]

IV. WEIGHTON, C. (1937). **Clinical Observations During an Outbreak of Foot and Mouth Disease in Tropical China. The Prophylactic Value of Convalescent Serum.**—*Vet. J.* **93.** 246-255. 4 figs. on 1 plate.

I. A powerful immunity may be produced in g. pigs by the administration of a vaccine consisting of virus which has been adsorbed out of infected lymph with $Al(OH)_3$. The vaccine contains about 4% of highly infected lymph in the mixture of adsorbent and diluent. For the preparation of such "adsorbate vaccine", lymph or blood serum may be used with equal success, and to obtain the best harvest of virus it should be collected within 24 hours of the time the donor was infected, as such virus has a better immunizing power than that collected 1-2 days later. When the virulence of virus is destroyed by incubation at 37°C. there is a coincident loss of immunizing ability, but if stored at about 2°C. the virus retains both virulence and immunizing power for many months.

II. A study of the artificial immunization of g. pigs.

III. In countries where the disease is endemic and where eradication is a hopeless undertaking, the mortality and serious sequelae can be largely overcome by the administration of antiserum to animals at the time they are exposed to natural infection. In such circumstances only mild attacks result which cause little economic loss. Adult bovines require a minimum dose of 200 c.c. of strong antiserum, calves 50-100 c.c., sheep 40 c.c., pigs 40 c.c. and piglets 15 c.c. Curative treatment of adult infected animals is not recommended, but is useful in the case of young animals.

IV. A report on the progress of infection through a herd of about 1,000 milch cows. A mortality of about 10% occurred amongst the cows and very heavy losses were sustained by the calf herd. The administration of convalescent serum in doses of 500 c.c. for adults and 100 c.c. for calves protected animals against serious attacks of the disease.—E. J. PULLINGER.

STEWART, J. G. (1937). **Production of Anti-Rinderpest Serum from Ex-Serum Bullocks.**—*Vet. J.* **93.** 294-295.

About three years after leaving the serum herd two bullocks were again hyperimmunized, and serum was obtained and tested in the usual way. Of two young bullocks given this serum and virulent blood, one died from rinderpest and the other developed severe symptoms, but recovered.

The two serum bullocks were again hyperimmunized and the serum retested. The tested animals died from rinderpest.

It is concluded that the titre of the serum produced by such bullocks was lower than normal.—F. H. MANLEY.

I. CAEMMERER, G. (1937). Blutentnahme und Seuchenverschleppung. [**The Spread of Infection by Blood-Sample Taking**].—*Tierärztl. Rdsch.* **43.** 164.

II. FISCHER, A. (1937). Blutentnahme und Seuchenverschleppung. [**The Spread of Infection by Blood-Sample Taking**].—*Ibid.* 235-236.

I. C. suggests that disregard for asepsis when collecting blood-samples for the diagnosis of glanders during the Great War was the cause of the wide spread of infectious anaemia in horses.

II. In refuting C's allegation, F. stresses that in his division an aseptic needle was used for each horse. The work was carried out with 20 needles ; after ten had been used, they were sterilized and in the meantime the other ten were used, and so on ; thus there was no delay in blood taking.—G. HARTMANN (VIENNA).

I. RUDDAT, E. (1936). Beiträge zur Epidemiologie der ansteckenden Blutarmut der Pferde im Saargebiet. [**Equine Infectious Anaemia in the Saar**]. —*Inaug. Diss.*, *Hanover.* pp. 65. 30 tables, 31 graphs. [Numerous refs.]

II. AUERMANN, B. (1936). Versuche über die Empfänglichkeit von Jungschafen für das Virus der infektiösen Anämie der Pferde. [**Susceptibility of Young Sheep to the Virus of E.I.A.**].—*Inaug. Diss.*, *Hanover.* pp. 47. 12 tables. [Numerous refs.]

III. BAUER. (1936). Verbreitung und Verlauf der ansteckenden Blutarmut der Pferde während der Jahre 1931-1934. [**E.I.A. in Germany 1931-1934**].—*Berl. tierärztl. Wschr.* **52.** 597-599.

IV. POLAC, G. (1936). Untersuchungen über die Beeinflussung des klinischen Befundes sowie des Blutbildes bei an ansteckender Blutarmut erkrankten Pferden durch Plastoserumpräparate. [**Effect of Plastoserum on E.I.A.**]. —*Inaug. Diss.*, *Hanover.* pp. 70. 24 tables. [Numerous refs.]

V. WILMES, H. (1937). Pathologisch-histologische Untersuchungen über das Vorkommen der ansteckenden Blutarmut bei Schlachtpferden des Regierungsbezirks Kassel. [**Infectious Anaemia in Slaughter-Horses in the Cassel District, Germany**].—*Z. InfektKr. Haustiere.* **51.** 50-56. 2 tables. [3 refs.]

VI. GLÄTTLI, H. (1937). Wird die perniziöse Anämie des Pferdes durch Blutegel übertragen ? [**Possible Role of Leeches in the Spread of E.I.A.**]. —*Schweiz. Arch. Tierheilk.* **79.** 165-168.

I. R. applied the following tests to 15 horses – most of them old and in bad condition – at the abattoir at Saarbrücken :– red blood corpuscle sedimentation, R.B.C. count, haemoglobin estimation and sublimate test and made microscopical examinations of the liver and spleen. In addition two rabbits were inoculated with blood from each horse. From the results it was shown that three horses were probably infected with E.I.A. ; an additional four showed some signs of anaemia.

He considers that the examination of sections of the liver and spleen is of most value in the diagnosis of the disease. In most cases the results of the rabbit inoculations agreed with the results of histological examination.

II. Nine sheep from five to seven months old were inoculated (subcut.) each with 5 c.c. of the mixed serum of horses infected with E.I.A. Two of them developed a general reaction accompanied by fever. At first there was a fall in the R.B.C. count in the test animals, but they soon returned to normal. The sheep were killed after five months and their livers were examined and showed an abnormally large number of " Kupfer " cells. The inoculation of rabbits with sheep blood gave a negative result. A. concludes that sheep were not suitable test animals for E.I.A.

III. This report applies to Germany as a whole and to the individual provinces. E.I.A. was very prevalent in Germany in 1933 when it was made notifiable by veterinary surgeons. There was difficulty in tracing the origin of

the cases observed, but in some instances it appeared that the disease had been transmitted by old army horses and by horses of the army of occupation. The terrain and natural water appeared to have some connexion with the disease. All attempts at transmission failed. Horses which recover clinically still harbour a latent infection and transmit the disease further. The only effective control methods are slaughter of the affected and suspected cases, the segregation of in-contact animals and careful disinfection.

IV. A " plasto-serum " preparation (composition not stated) was given to 22 horses affected with E.I.A. A temporary improvement occurred, but there was no permanent good result.

V. Histological examinations of the liver, spleen and heart muscles of 300 horses slaughtered at abattoirs in the Kassel district were carried out at the Berlin Veterinary College. Basing a positive diagnosis on all three tissues collectively, only 20 cases were judged to be E.I.A. Judging from this figure the disease is more prevalent in Kassel than is suggested. Similar tests are to be made with material from other parts of Germany.

VI. Glättli found a dozen leeches on a horse which was killed on account of E.I.A., and he wonders whether leeches have any part in the spreading of the disease in low lying country where leeches have opportunities to reach horses on the river pastures.—F. Freudenberg (Berlin).

I. Ackermann, L. F. (1936). Algunas observaciones sobre un foco de encefalomielitis equina durante la epizootia de Enero-Febrero de 1936. Ensayos de tratamientos y vacunación. [**Equine Encephalomyelitis in the Argentine Early in 1936**].—*Rev. Med. vet., B. Aires.* **18.** 471-483.

II. Quevedo, J. M. (1936). Breves comentarios clínicos sobre la última epizootia de encéfalo-mielitis de los equinos. [**An Outbreak of Equine Encephalomyelitis**].—*Ibid.* 536-543. 4 figs.

III. Sívori, F. (1936). La encefalomielitis de los equinos – Los ultra-virus. [**The Virus of Equine Encephalomyelitis**].—*Ibid.* 723-735. 2 tables. [1 ref.]

I. A. conducted field observations in conjunction with laboratory work. In 14 fatal cases of equine encephalomyelitis, 70% of which showed typical subacute symptoms, the most constant P.M. findings were coprostasis and large quantities of turbid cerebrospinal fluid. The presence of large numbers of *Gastrophilus nasalis* larvae in the stomach and pyloric region was constantly noted. Of five aged horses injected intracerebrally with mixtures of brain emulsion from the 14 fatal cases, four became infected. Other routes of inoculation in three horses produced local reactions only. Vaccination of healthy animals with 10 c.c. of 33% infected brain emulsion in chloroform appeared to give serviceable immunity. A. notes that the outbreak occurred one month after a plague of mosquitoes.

II. The 1935-1936 outbreak in Argentina, which appeared simultaneously in widely separated districts, was characterized by anorexia, somnolence, depression of the head (which was almost always inclined to the right), progression in circles, altered stance, loss of vision in one or both eyes, drooping lips and every degree of paralysis. Coprostasis was a constant symptom. In addition adenitis and a mucopurulent catarrh were noted, with facial asymmetry and grinding of teeth.

General therapy and nursing help in the recovery of the non-fatal cases.

III. A general review of the literature. S. considers that there are four types of the virus *viz* :– (1) North American, Eastern ; (2) North American, Western and Argentine ; (3) Yugoslavian, and (4) four to six Russian varieties.

—J. A. Pasfield.

BEARD, J. W., FINKELSTEIN, H., SEALY, W. C., & WYCKOFF, R. W. G. (1938). **The Ultracentrifugal Concentration of the Immunizing Principle from Tissues Diseased with Equine Encephalomyelitis.**—*Science.* **87.** 89-90. [4 refs.]

Suspensions of the brains of g. pigs with equine encephalomyelitis were formolized and subjected to high speed centrifugation. The deposit and supernatant fluid were tested for immunizing value on g. pigs, which were given 100-500 M. L. D. of virus two weeks later. It was found that the deposit conferred a strong immunity and that the supernatant fluid was inactive in this respect.—J. E.

GALLIA, E. (1937). Beitrag zum Wesen der sogenannten "Teschener Krankheit" ("Ansteckende Lähmung der Schweine", "Encephalomyelitis enzootica suum"). [**Enzootic Encephalomyelitis of Swine**].—*Prag. tierärztl. Arch.* **17.** 49-51.

A discussion upon "Teschin sickness" [*V. B.* **4.** 466.], a disease of swine occurring in parts of Czechoslovakia, characterized by partial or complete paralysis. According to one author, MACEK [*V. B.* **7.** 18.], P.M. examination reveals changes closely resembling those found in swine influenza. The gastric and intestinal mucous membrane is oedematous and hyperaemic. Broncho-pneumonic changes are also observed. The disease may be transmitted to young pigs and rabbits by the inoculation of infective brain material, and nystagmus and motor disturbance are observed. According to DOUBRAVA [*V. B.* **6.** 232.] the disease is only transmissible to swine; MACEK, however, has succeeded in transmitting it to white rats, mice, rabbits, dogs and cats. The aetiology of the condition is at present not clearly understood.—E. C. HULSE.

ROSSI, P., BLANCHOT, & PEGON. (1937). Trois cas de maladie d'Aujeszky. [**Three Cases of Aujeszky's Disease (in Heifers)**].—*Bull. Soc. Sci. vét. Lyon.* **40.** 35-39. [4 refs.]

The symptoms and P.M. appearance of the disease in the three cases are given. Subinoculation of brain-tissue from two of the cases into mice and rabbits reproduced the disease. A rabbit inoculated with material from the third case also died after exhibiting typical symptoms.—F. H. MANLEY.

REMLINGER, P., & BAILLY, J. (1937). La souche africaine de la maladie d'Aujeszky. [**The African Strain of Aujeszky's Disease**].—*Maroc méd.* **17.** 308-311. [2 refs.]

This is a comparison between the African, European and American strains. The experiments were carried out on rabbits, rats, g. pigs, dogs, cats and asses. Typical symptoms were produced, and are described in detail. Mention is made of the lesions found P.M., a notable feature being the rapid liquefaction which occurs in the central nervous system after death. Transmission experiments are described, and the distribution of the virus in the body discussed, there being no difference between the various strains. The occurrence of avirulent zones in the C.N.S. is important from the diagnostic point of view. The virus is preserved in glycerin, and when infected and healthy spinal cords are immersed together in glycerin the virus can pass to the healthy cord.

The African virus would appear to be virulent in much higher dilution than the European strain, and this is a convenient means of separating the strains. The European strain is the more resistant to desiccation. The American and European strains were also more resistant to exposure to ether.

Preliminary immunity experiments indicated the purity of the strains.
—F. H. MANLEY.

I. SCHÜKRÜ-AKSEL, I. (1936). Etude histo-pathologique et expérimentale sur la pathogénie de la rage. [**Histopathology of Rabies**].—*3rd int. Congr. comp. Path. 1936.* **2.** 453-457. 2 figs. [Numerous refs.] [In French].

II. REMLINGER, P., & BAILLY, J. (1936). Contribution a l'étude de la vaccination antirabique par les vaccins phéniqués. [**Phenolized Vaccines against Rabies**].—*Maroc méd.* **16.** 628-630. [2 refs.]

III. KANAZAWA, K. (1937). Sur la culture *in vitro* du virus de la rage. (Deuxième mémoire). [**Cultivation of Rabies Virus** *in vitro*. **II**].—*Jap. J. exp. Med.* **15.** 17-27. 2 figs. [3 refs.] [In French].

I. Histological changes are observed in those parts of the cerebrum which are in contact with the cerebrospinal fluid. The predilection seat of the virus is the substantia nigra and the area adjacent to the aqueduct of Silvius. By intradural inoculation of rabbits with a mixture of methylene blue and rabies virus, particles of the dye are demonstrable in the above sites and in no other parts of the brain or in the meninges.

II. The technique for the preparation of a phenolized antirabic vaccine is described. The results of a number of experiments show that satisfactory immunization of rabbits, dogs and donkeys can be obtained by the use of this vaccine. By comparison with the vaccine prepared by the standard technique (dried spinal cords of rabbits), the authors maintain that the phenolized vaccine has many advantages. The vaccine is easily prepared from the entire spinal cord and brain of an infected dog, and its sterility is readily controlled during the course of production. The immunizing properties are retained for some months and vaccination may be performed in localities remote from the recognized institutes. It is concluded that the phenol vaccine is well adapted to present-day conditions.

III. Cultivation of the rabies virus *in vitro* has proceeded for 26 passages. [See *V. B.* **7.** 331]. The virulence of the cultivated virus for mice differs during each successive passage. The virus rapidly loses its virulence when it is sown in culture flasks ; after the third day the titre increases, and reaches its maximum between the fourth and sixth days.

Neutralization of the virus *in vitro* by the use of an antiserum indicates that the cultivated virus is identical with a strain of virus maintained by intracerebral passage in rabbits. Histological examination of the brains of mice infected with both strains reveals brain lesions and it is concluded that there is no modification in the properties of the virus after prolonged culture.—E. C. HULSE.

REMLINGER, P., & BAILLY, J. (1936). Transmission de la rage à la cigogne (*Ciconia ciconia*). [**Transmission of Rabies to the Stork**].—*C. R. Soc. Biol. Paris.* **123.** 383-385.

The authors succeeded in infecting two storks with rabies by the subdural inoculation of street virus. The birds showed progressive paralysis terminated by death.—J. E.

MÓCSY, J. (1937). A veszettség ellenes oltások után keletkezőagy- és gerincvelőgyulladásokról. [**Encephalomyelitis Following Vaccination against Rabies**]. —*Közl. Oesszehas. élét- és kórtan Köréből.* **28.** 171-193. 12 figs. [4 refs.] [Also appeared in *Arch. wiss. prakt. Tierheilk.* **72.** 15].

Of 33,000 dogs vaccinated against rabies by Kondo's method in Budapest in 1935 and 1936, 0·25% and 0·2% respectively became affected with post-vaccinal paralysis and 0·08% and 0·05% died. The affected dogs showed weakness and hyperaesthesia, usually 6-12 days after vaccination and they often showed increased irritability. Histological examination of the nervous system of such dogs showed

a non-purulent encephalomyelitis affecting both the grey and the white matter, being most marked in the spinal cord. Rabies virus was never recovered from the affected animals.—G. SÀLYI (BUDAPEST).

REMLINGER, P., & BAILLY, J. (1937). Contribution à l'étude de l'action du bicarbonate de soude sur le virus-fixe. Transformation de la symptomatologie paralytique du chien en rage furieuse. [**Action of Sodium Bicarbonate on Fixed Rabies Virus: Transformation of Virus Causing Dumb into Type Causing Furious Rabies**].—*Bull. Acad. vét. Fr.* **10.** 99-105. [2 refs.] [Also appeared in *Maroc méd.* **17.** 330-333].

The fixed virus of the Pasteur Institute at Tangiers produces paralytic rabies and does not produce furious symptoms in either rabbits or dogs. But if the virus is mixed with powdered sodium bicarbonate and inoculated subdurally in rabbits and dogs symptoms of excitability develop, the latter showing typical furious rabies. Using a street virus that produces dumb rabies, the transformation to the furious type was not obtained, nor was it with other salts, but a somewhat similar result was obtained by MILLISCHER and MARTEAU in rabbits by the use of frozen brain [*V. B.* **7.** 424]. The reaction is assumed to be of a physico-chemical nature.—A. WILSON TAYLOR.

I. WEBSTER, L. T., & CLOW, Anna D. (1937). **Propagation of Rabies Virus in Tissue Culture.**—*J. exp. Med.* **66.** 125-131. 1 text fig., 2 tables. [10 refs.]

II. LÉPINE, P., & SOUTTER, V. (1937). Essais expérimentaux sur la valeur pratique des vaccins antirabiques phéniqués. [**The Practical Value of Phenolized Antirabies Vaccines**].—*Ann. Inst. Pasteur.* **59.** 39-56. [18 refs.]

III. PAWAN, J. L. (1937). **Infectivity of the Saliva in Paralytic Rabies.**—*Ann. trop. Med. Parasit.* **31.** 267-270. 1 fig., 2 tables. [6 refs.]

I. Three strains of rabies virus have been propagated in tissue culture by the use of serum-Tyrode solution containing either embryo mouse brain or embryo chicken brain. A detailed description is given of the technique employed. The titre of the original inoculated virus was 10^{-5}; after two to eight days' incubation the titre of a primary culture was 10^{-2}. After six serial transfers the titre increased to 10^{-5} or 10^{-4} and it remained at this level for 42 passages. Mice inoculated with the undiluted culture succumbed to rabies in seven to eight days.

In an immunity test, 0·25 c.c. doses of culture virus, injected intraperitoneally, protected mice against subsequent intracerebral inoculations with 1,000 times the lethal dose of test virus.

II. A comparative study of the relative immunizing properties of dried cord (Pasteur method), phenolized and formolized vaccines upon rabbits. Each rabbit received 2 c.c. of vaccine (subcut.) daily for 15 days. The dried cord vaccine protected 35% of the rabbits against street rabies virus inoculation; 61·7% were protected by the various samples of phenolized vaccine. One of the latter immunized 77·7% of the rabbits. A freshly prepared phenolized vaccine, "attenuated" for 24 hours at 20°-22°C. was found to be as efficient as one "attenuated" at 37°C. Vaccines prepared more than 30 days previously were more potent after "attenuation" at the lower temperature. The efficacy of the vaccine was not diminished after two months cold storage. Formolized vaccine gave similar results to the phenolized vaccine.

Since phenolized vaccine is easily prepared, it is suggested that it could be given by the local doctor instead of sending the patient to a Pasteur Institute.

III. In Trinidad, excessive salivation commonly occurs in paralytic rabies in man and animals. Although the saliva is often removed by hand from the mouths

of infected cattle by the attendants, no one has so far contracted the disease by this practice. Saliva was collected on sterile swabs from the mouths of six infected cattle and two horses and was rubbed on the scarified abdominal wall of rabbits. Paralysis and subsequent death occurred in every case 8-15 days after infection. This experiment was repeated with the saliva of six rabid persons and similar results were obtained, death occurring at intervals ranging from 4-71 days. Negri bodies were demonstrable in most cases, and the nervous tissue was proved to be infective by further rabbit passage. In a similar series of experiments, rabies was demonstrated in the saliva of vampire bats.—E. C. Hulse.

Hupbauer, A., & Tomašec, I. (1937). Prilog imunizaciji svinja protiv kuge sa kristalviolet vakcinom. [**Immunization against Swine Fever by Crystal Violet Vaccine**].—*Vet. Arhiv.* **7.** 484-490. 3 tables. [German summary].

A vaccine was prepared against S.F. by Dorset's crystal violet method, the virus being kept for two weeks at 37·5°C. after the addition of phenol and the dye. The results of tests on pigs seemed to indicate that the immunity conferred was in inverse proportion to the attenuation of the vaccine and proportional to the reaction it caused. This method is not advocated because of the difficulty in preparation and owing to the fact that attenuation of the virus continues as long as the vaccine is kept at atmospheric temperature.—B. Oswald (Split).

Donatien, A., & Lestoquard, F. (1937). Mesures sanitaires à prendre en Afrique du Nord pour éviter l'introduction de la "Heart water" de l'Afrique Noire. [**Measures taken in North Africa to Prevent the Introduction of Heartwater from Equatorial Africa**].—*Arch. Inst. Pasteur Algér.* **15.** 424-426.

The authors draw attention to the necessity of preventing the introduction of heartwater (and also other diseases) into north Africa and recommend that concerted action should be taken in Tunisia and Morocco. Animals susceptible to heartwater should not be admitted, and non-susceptible species should be subjected to dipping, etc. Amblyomma, the vector of heartwater, is not known to exist in north Africa, but it is also not known whether local ticks could convey the disease.
—S. J. Gilbert.

Slanetz, C. A., & Smetana, H. (1937). **An Epizootic Disease of Ferrets Caused by a Filterable Virus.**—*J. exp. Med.* **66.** 653-666. 8 figs. on 2 plates, 3 charts. [3 refs.]

The authors describe the histopathology of the first outbreak they encountered. The same ferret quarters were used several months later and another outbreak occurred concurrently with one in a small breeding colony. The spontaneous disease caused an elevation of temperature up to 106°F. which remained high until death (contrary to the behaviour in distemper), a conjunctivitis which matted the lids together, loss of appetite and lethargy.

A watery nasal discharge frequently became mucopurulent and breathing was laboured. Sneezing was rarely observed and weight loss was negligible. The mortality rate varied from 70-100%.

The disease was induced in two normal ferrets by feeding dust from the ferret room. These developed typical symptoms in about a week. Berkefeld filtrates of an emulsion of lung and nasal mucosa, from one of these ferrets, in salt solution or broth, given either intranasally, subcutaneously or intradermally, caused symptoms in ferrets in 4-5 days, whilst contact infection developed in 7-10 days. Ninety-eight ferrets thus tested all died.

Details of experiments are given which show that there is no cross-immunity of this disease with canine distemper or human influenza and that mice, rats, g. pigs, rabbits and dogs are naturally immune. The causative agent is a filtrable virus, but secondary infection of the respiratory tract, especially by haemolytic streptococci, often occurs.

Histologically, cytoplasmic and intranuclear inclusions indistinguishable from those found in dog distemper occur in the epithelial cells of many organs, especially those of the respiratory tract, renal pelvis, bladder, cornea and conjunctiva, and these are well illustrated by photomicrographs.—C. V. WATKINS.

VAN DORSSEN, C. A. (1937). Aetiologische onderzoekingen betreffende de pseudomembraneuze enteritis van de kat. [**Pseudomembraneous Enteritis in the Cat**].—*Tijdschr. Diergeneesk.* **64.** 16-25. [Numerous refs.] [English, French and German summaries].

Infectious pseudomembraneous enteritis in the cat (distinguishable from feline distemper) is due to a filtrable virus. Though the majority of the experimentally infected cats remained unaffected, the incubation period could be established as 14 days in two typical cases. The disease described resembles that reported elsewhere [*V. B.* **5.** 19].—C. BUBBERMAN (SCHIEDAM).

VAN HEELSBERGEN, T. (1936). Geflügelpocken. [**Fowl Pox**].—*3rd int. Congr. comp. Path. 1936.* **1.** Pt. 1. Vet. Sect. 140-154. [In German: French summary].

A résumé of the characters of the disease and its causal agent and a discussion of the relationship of the avian to the mammalian strains of virus. Reference is made to those relevant articles [unfortunately the actual bibliographical references have not been printed] which tend to show that the mammalian and avian types of fowl pox are all variants of one parent stock and that these variants, as they occur in nature, do not differ greatly from one another. The main evidence quoted refers to cases of cross-infection and partial cross-protection.—E. J. PULLINGER.

I. LEVADITI, C., & HABER, P. (1937). Recherches sur le virus de la peste aviaire pathogène pour la souris, ses affinités pour les néoplasmes. [**The Pathogenicity of Fowl Plague Virus for Mice and its Affinity for Neoplasms**]. —*Rev. Immunol.* **3.** 5-24. 11 figs., 5 tables. [Numerous refs.]

II. LEVADITI, C., SCHOEN, R., & REINIÉ, L. (1937). Virus de la peste aviaire et tumeur de Pearce. [**Virus of Fowl Plague and the Pearce Rabbit Tumour**]. —*C. R. Soc. Biol. Paris.* **124.** 711-713. [3 refs.]

I. Mention is made of the susceptibility of mice to fowl plague virus by intranasal inoculation and of their insusceptibility when virus is inoculated on to the corneal surface or into the anterior chamber of the eye. The main part of the article deals with the histology of the liver lesions after intranasal inoculation. The hepatic cells show nuclear and cytoplasmic changes. The nuclear chromatin becomes fragmented and oxyphil granules appear. The cell cytoplasm is usually packed with extremely fine homogeneous elementary bodies which are coloured red by Mann's stain. At a later stage round or oval oxyphil bodies with a definite internal structure and surrounded by a clear halo are prominent. These are analogous to the Negri bodies of rabies and appear to originate from the elementary bodies. Fatty changes in the hepatic cells form a striking feature of the pathology of the condition.

A special affinity of fowl plague virus for neoplastic elements and in particular for epithelial tumours is recorded. Multiplication of the virus takes place in the

neoplastic cells which necrose and become incapable of proliferating when subsequently grafted.

II. In contrast to the findings in mice affected with epithelial neoplasms, the virus in rabbits becomes localized in the neoplastic cells without modifying their anatomical structure or destroying their proliferating power. In mice the cancer is lysed and loses all power of subsequent growth. It is suggested that the virus is cancerolytic for the mouse because of the remarkable susceptibility of this animal to the virus, whereas the rabbit possesses a strong natural immunity to the pathogenic activities of the virus.—D. R. WILSON.

KARSTEN. (1937). Ueber eine bösartige, wahrscheinlich durch ein filtrierbares Virus hervorgerufene Seuche des Kanarienvogels (Laryngotracheitis infectiosa). [**Infectious Laryngotracheitis in Canaries**].—*Dtsch. tierärztl. Wschr.* **45.** 12-14. [9 refs.]

A brief description of this disease in canaries, which is characterized by respiratory symptoms that progress extremely rapidly, so that death may intervene within a few hours of the onset of infection, or at the latest within a few days. Chronic non-fatal cases also occur, but the disease is associated with a very high mortality. Lesions are not particularly characteristic and are confined to the respiratory system. There is congestion, swelling and haemorrhage of the mucous membrane of the whole tract, the lung is oedematous and contains inflammatory infiltration, whilst there is a fibrinous exudate in the pleural cavity. No definite bacterial cause of this disease could be identified and the diverse species of bacteria isolated from different cases were all thought to be secondary invaders. In view of the high infectivity of the disease under ordinary conditions, and the ease with which infection could be transmitted with exudate, blood or tissue material from affected birds, it is thought to be caused by a filtrable virus.—E. J. PULLINGER.

ENGELBRETH-HOLM, J., MEYER, A. R., & UHL, E. (1937). **Effect of Growth- and Gonadotropic Hormones on Leucemia and Sarcoma in Fowls.**—*Acta path. microbiol. scand.* **14.** 481-490. 2 tables. [18 refs.] [In English].

The experiments carried out showed that the growth hormone did not accelerate the development of haemocytoblastosis or sarcoma and that the gonadotropic hormone had some inhibitory effect on the development of sarcoma, but none on haemocytoblastosis. In the work on the latter condition the material used for inoculating the birds (leucaemic blood) was very highly virulent, and in one experiment it is stated that all the birds died of this disease, after an average of nine days after inoculation in the control group and eight days in the hormone treated group.—W. J. IRONSIDE.

WILLIAMS, J. C. (1936). **An Hypothesis concerning Bacteriophagy.**—*J. phys. Chem.* **40.** 477-479. [9 refs.] [Copied *verbatim* from *Rev. appl. Mycol.* **15.** 595-596.]

The hypothesis is advanced that bacteriophage may be a suspension of minute crystals of one or more of the compounds comprising the homologous bacteria, in which case bacteriophagy would represent the seeding of these amorphous compounds by the phage particle and their subsequent crystallization.

Evidence of the particulate nature of bacteriophage has been presented by various workers, and the size of the particles of different phages has been measured. The antigenic properties of phage indicate that it is a protein, a fact confirmed by Schlesinger's analysis of a phage in which 13 per cent. nitrogen was found. Proteins being hard to crystallize, spontaneous crystal formation would be expected to be

rare and seeding highly specific, both of which conditions are in accord with the character of bacteriophage, a particular phage attacking only its homologous bacteria and closely related species.

When bacteria are attacked by phage a number of cells simply disappear, while others swell and finally burst, both these processes being the logical outcome of the action of crystallization. Further support is lent to the crystallization theory by the sensitiveness of bacteriophage to protective substances and high viscosity. Thus, bacteriophagy was shown by Bronfenbrenner and Hetler to be inhibited by the presence in the medium of 4 to 5 per cent. agar, while Colvin and Evans demonstrated a similar effect in respect of serum, ascitic fluid, saliva, pus, and urine, and D'Hérelle reported inactivation with glycerol. A further indication of crystallization may be the granular appearance of bacteria subject to bacteriophagy. In conclusion, some possible objections to the crystallization hypothesis are briefly discussed, the implication being that improved methods of procedure would dispose of any apparent flaws in the theory.

PARASITES IN RELATION TO DISEASE [ARTHROPODS].

PATTON, W. S. (1935). **Classification of the Myiasis-Producing Diptera of Man and Animals.**—*Inst. exp. Med., Moscow. Coll. Works Commem. 25th Anniv. Prof. Pavlovskii, 1909-1934.* pp. 269-271. [In English : Russian summary].

A brief review of the types of human and animal myiasis. A biological classification of the myiasis-producing species of flies is made on the basis of whether the host invasion is accidental, a specific habit, as in the case of *Hypoderma sp*, or a semi-specific habit, as with the sheep blowflies, which normally lay their eggs on carrion.—J. MACLEOD.

FERNANDEZ, D. B. (1936). **Tick Problem at the Alabang Stock Farm.**—*Philipp. J. anim. Indust.* **3.** 369-383. 1 fig. [14 refs.]

A discourse on the evils of tick infestation on the farm, and the routine of remedial measures against *Boophilus australis*. Plans of a dipping bath are given and four methods of preparing dip solutions. Garlic was proved to be useless. —E. E. JELBART.

KEAY, Gladys. (1937). **The Ecology of the Harvest Mite** (*Trombicula autumnalis*) **in the British Isles.**—*J. Anim. Ecol.* **6.** 23-35. 1 fig., 1 table. [Num. refs.]

K. made an enquiry into the distribution of harvest mites in Great Britain and Ireland and here gives the results. The mites were reported seven times from horses, three times from sheep, 51 times from dogs, 18 times from cats, and were also found on one fowl and one turkey. In addition, many wild animals were found to be infested. The parasites tend to congregate in clusters and thus become visible as orange patches on the skin.—J. E.

PARASITES IN RELATION TO DISEASE [HELMINTHS].

WETZEL, R. (1935). Die Beziehungen parasitischer Würmer zum Wirtstier. [**Relations between Parasitic Worms and their Hosts**].—*S. B. Ges. naturf. Fr. Berl. 1935.* pp. 291-304. [Copied *verbatim* from *Helminth. Abstr.* **4.** 205. Signed B. G. P.]

Wetzel, in an interesting discussion of the host-parasite relationship, sum-

marizes much recent work on the mechanical effects of parasites, effects through deprivation of food, and effects of the parasite's excretions and secretions on the host, and the protective responses thereby induced. He sees the relationship as a precarious equilibrium which can be upset in favour of either the host or the parasite. The discussion touches upon aspects of physiology, pathogenesis and immunity too numerous to be detailed here.

VUYLSTEKE, C. (1935). Étude de quelques nématodes parasites de l'éléphant. [**Nematode Parasites of African Elephants**].—*Rev. Zool. Bot. afr.* **27.** 319-325. [Copied *verbatim* from *Helminth. Abstr.* **4.** 203. Signed R. T. L.]

Seven species of nematodes from the African elephant are described, *viz.*: *Amira* sp.?, *Quilonia africana*, *Q. apiensis*, *Murshidia longicaudata*, *M. hadia*, *Grammocephalus clathratus* and *Syngamus loxodontis* n. sp. This new gapeworm is nearly related to *S. indicus*, differing in the structure and dimensions of the bursa and the greater size of the buccal capsule.

ANDREWS, Mary N. (1937). **The Helminth Parasites of Dogs and Cats in Shanghai, China.**—*J. Helminth.* **15.** 145-152. 2 tables. [7 refs.]

The parasites found on examination of the stomach and intestines of 590 dogs and 185 cats comprised seven species of trematodes, three of cestodes and six of nematodes. *Dipylidium caninum* was present in 59% of dogs and *Clonorchis sinensis* in 79% of cats. Parasites were absent from 3% of cats and from 12% of dogs.—W. J. IRONSIDE.

ALICATA, J. E., & SWANSON, L. E. (1937). *Fasciola gigantica*, **a Liver Fluke of Cattle in Hawaii, and the Snail** *Fossaria ollula*, **its Important Intermediate Host.**—*J. Parasit.* **23.** 106. 1 fig.

This small lymnaeid snail has not been previously recorded as a vector of liver fluke. Snails identified as *Fossaria ollula* were found naturally infested with cercariae of *Fasciola gigantica*. The encysted cercariae were experimentally fed to rabbits and the adult flukes were subsequently identified.—E. E. JELBART.

I. BRUMPT, E. (1936). *Schistosoma bovis* et *Schistosoma mansoni* ne sont pas transmis par *Planorbis* (*Indoplanorbis*) *exustus*. Observations biologiques concernant ce planorbe (autofécondation, érosion de la coquille, élevage, etc.) [*S.b.* **and** *S.m.* **are not Transmitted by** *Pl.e.*].—*Ann. Parasit. hum. comp.* **14.** 464-471. 2 figs. on 1 plate. [20 refs.]

II. BRUMPT, E. (1936). Action des hôtes définitifs sur l'évolution et sur la sélection des sexes de certains helminthes hébergés par eux. Expériences sur des schistosomes. [**Action of Hosts on Development and Sexual Selection of Certain Helminths: Schistosomes**].—*Ibid.* 541-551. 2 figs., 1 table. [14 refs.]

III. VAN DEN BERGHE, L. (1937). Quelques faits nouveaux concernant la migration et la ponte des schistosomes. [**New Facts Concerning the Migration and Reproduction of Schistosomes**].—*Ibid.* **15.** 354-362. 2 figs. on 1 plate. [7 refs.]

IV. VAN DEN BERGHE, L. (1937). **A Morphological Study of Bovine Schistosomes.**—*J. Helminth.* **15.** 125-132. 1 text fig., 10 figs. on 1 plate. [12 refs.]

I. 50 young specimens of *Pl.e.* could not be infected with *S.b.* eggs although 32 *Bullinus contortus* were all so infected within a month. Similarly eggs of *S.m.* were infective for eight out of 46 *Pl. boissyi* although 50 young specimens of *Pl.e.* all remained free from such infection.

B. refers to *Pl.e.* as being a secondary host of the following trematodes :– *S. spindale*, *S. nasalis* and a third schistosome infective for mice and of which the furcocercaria stage causes " Sawah itch " in man in Malay.

Biological details of this mollusc are given.

II. B. shows that *S. bovis* is infective for g. pigs, the worms invading the liver, mesentery, lungs and right side of the heart in the average proportion of 2·32 males for each female present in 10 g. pigs (total, 12,444 worms). This differs from a previous finding with *S.b.* in the same host by the author, and also with results obtained with *S. spindale*, as males alone proved infective previously.

The action of hosts upon the size and shape of male and female *S.b.* is illustrated by scale drawings of average specimens obtained from the g. pig, mouse, cat, monkey (*Macacus rhesus*), dormouse, rat and sheep. The monkey proved a host in which both sexes of *S.b.* remained small in size and the females sterile. In another species of monkey (*M. sinicus*) only immature females were found at autopsy. B. notes that such a check in the development of female schistosomes may be rectified by a succeeding infection by males, as judged by previous findings with several other schistosomes. Female *S.b.* developing in rats also remained sterile.

III. From extensive studies of natural and experimental infestations of cattle with two species :– *S. bovis* and *S.b.* var. *mattheei*, of one antelope species, *S. margrebowiei*, and of a human species, *S. mansoni*, the author found that cattle species may have eggs lying with the spines facing in both directions in the same uterus, thus accounting for a similar disposition of eggs in the capillaries of infested intestinal mucous membrane of cattle. Eggs can therefore travel down the uterus with the spine directed backward or forward without causing damage, and it is assumed that the spine cannot be the chief means of migration of these eggs in their host. Female *S. margrebowiei* are occasionally found outside blood vessels and in lymphatic vessels. In addition, the author confirms the findings of other investigators. Females of all these four schistosomes may be found in veins adjoining the intestine, but male specimens are much more rare in this situation. Free-living males are four times more numerous than free-living females in the veins of the liver. Coupled schistosomes are not only found in the small vessels of the submucosa, but also in the large mesenteric veins. Eggs found in the liver are, in part, arrested there after passage through the portal blood stream, but most of them are laid by female worms actually in the intrahepatic ramifications of the portal vein.

IV. The author quotes the description of McHattie and Chadwick (1932) for *S.b.*, which also embraces the closely related species *S. mattheei* [*V. B.* **3.** 254]. He has previously shown that the size of adult worms, the shape of the ovary, the size and shape of the eggs and the comparative length of the caecum serve as the best means of differentiating schistosomes, but thinks *S. mattheei* is best considered as a variety of *S.b.* just as *S. intercalatum* is deemed a variant of *S. haematobium*. He shows by photomicrographs and graphs that all the above-mentioned schistosomes have characteristic morphology as regards the female worms, but that individual specimens may have variant characters rendering classification difficult apart from their location in the host and the specificity of that host. He classifies the two variants as follows :–

(1) *S. haematobium* var. *intercalatum*, conforming to the type species but with larger eggs resembling those of *S.b.* var. *mattheei* ; location purely intestinal ; parasites of man limited to the river Congo area.

(2) *S. bovis* var. *mattheei*, conforming to McHattie and Chadwick's description of *S. bovis* ; eggs very polymorphous but usually lozenge-shaped ; female

worms are twice as thick as *S.b.*, although the eggs of both species are of the same size; the ovary has a regular cylindrical shape.

He considers that these four schistosomes are biological races of a single species.—C. V. WATKINS.

RAO, M. A. N. (1937). **A Preliminary Report on Canine Schistosomiasis in the Madras Presidency.**—*Indian J. vet. Sci.* **7.** 109-112. 3 figs. on 1 plate, 1 table. [6 refs.]

R. records an indigenous case of dysentery in a dog due to schistosomiasis, the ova resembling those of *Schistosoma suis*. The ovum and the miracidium are described, interesting points in the morphology of the latter being shoulders on the margin, the absence of a ciliary girdle and the presence of refractile bodies near the digestive sac.—E. E. JELBART.

PALAIS, M. (1937). Développement de *Taenia saginata G.*, dans les cas de parasitisme multiple. [**Development of** *Taenia saginata* **in Cases of Multiple Parasitism**].—*Bull. Soc. Path. exot.* **30.** 485-490. 1 table. [5 refs.]

P. sets out in tabular form the structure of specimens collected, as compared with SOMMER's details for a complete specimen quoted by BLANCHARD (1889).

The structure of this species of worm is very variable in almost all respects. P. concluded that the general effect of multiparasitism on its structure was to cause a reduction in the size and number of the segments, but a quickening of the development of the genital apparatus. However, no abnormalities were noted in the latter.—C. V. WATKINS.

SIMA, I. (1937). A Taenia és Cysticercus pisiformis elleni immunitás. [**Immunization Against Taenia and** *Cysticercus pisiformis* **Infestations**].—*Állatorv. Lapok.* **60.** 1-4. [8 refs.]

Two rabbits which were each given 150 *Taenia pisiformis* onchospheres were found to be completely resistant to reinfection 62 days later. Their immunity could be transferred to other rabbits by means of 5-25 c.c. of serum, but this immunity was not passed on to the rabbits' progeny. A 5% aqueous extract of dried taenia or *Cysticercus pisiformis* injected 5-7 times in doses of 1-2 c.c. subcutaneously into the rabbits only caused a slight degree of immunity. Dogs could not be immunized by this method nor were dogs already infested immune to reinfestation with the same parasite, although some resistance seemed to be evinced against other species of *Taenia*.—G. SÁLYI (BUDAPEST).

ENGEL, E. (1937). Wagrzyca bydła jako aktualny problem higieny miesa. [**Cysticercus Infection in Cattle and Meat Hygiene**].—*Przegl. wet.* **52.** 414-417.

E. suggests that the true incidence of cysticercosis in cattle in Poland is greater than the abattoir statistics indicate. He advocates more thorough inspection than occurs at present.—A. SZWABOWICZ (LWÓW).

WARDLE, R. A. (1937). **Taxonomic Status of** *Diphyllobothrium latum* **in Western Canada.**—[Copied *verbatim* from *J. Parasit.* **23.** 537].

On the basis of accepted criteria for the differentiation of species of *Diphyllobothrium*, diphyllobothriid material from man and dog in the district of Winnipeg, one of the three endemic areas of diphyllobothriosis in North America, is adjudged to be homogeneous and to be specifically identical with authenticated *D. latum* from Russia, Finland and Japan. The classificatory value of various characteristics in Canadan material are discussed.

I. STUNKARD, H. W. (1937). **The Life Cycle of Moniezia expansa.**—*Science.* **86.** 316. [1 ref.]

II. STOLL, N. R. (1937). **Tapeworm Studies. V. Absence of** *M. expansa* **from the Sheep Intestine Early after Infection.**—*Amer. J. Hyg.* **26.** 148-161. 1 fig., 1 table. [Numerous refs.] [See also *V. B.* **6.** 872].

I. S. refers to his review (1934) of studies on the life cycle of anoplocephaline cestodes [*V. B.* **5.** 359.] and reports experiments which showed the necessity of an intermediate host to complete the cycle. He now shows that free-living mites will eat cestode eggs and that the onchospheres hatch in the intestines and migrate to the body cavity of the mites. Eggs of *M.e.* were fed to specimens of *Galumna* sp. and thousands of these mites were dissected at different intervals later. The developmental stages from the onchospheres to the infective cysticercoid stage have thus been determined.

II. S. records five experiments with susceptible ewes and their lambs exposed in a pasture infested with *M.e.* Animals exposed seven days and then killed showed no tapeworms. Similarly exposed animals kept indoors for several days afterwards and then killed contained tapeworms. Other sheep kept as controls, and not killed, on the same pasture, showed by later faecal examination that they had contracted infection at the same time as the positive cases. No sheep showed intestinal infection before the ninth day after exposure. The lengths of the worms and the sizes of the strobilae after a limited exposure of the sheep to infection and a period between the start of exposure and P.M. examination varying from 14-28 days are tabulated. The measurements were all very small when compared with growth rates of other tapeworms acquired after ingestion of intermediate stages and, moreover, adult forms of the latter were usually recoverable 1-2 days later. S. concludes that these findings point to an initial tissue invasive stage of *M.e.* in sheep; also that such tissue invasion probably accounts for the immunity against *M.e.* which develops in sheep and similar to that noted against various stages of other tapeworms in both intermediate and definitive hosts.—C. V. W.

STOLL, N. R. (1937). **Rates of Acquisition by Grazing Sheep of** *M. expansa* **and What They Reveal of the Available Pasture Infestation.**—[Copied *verbatim* from *J. Parasit.* **23.** 568-569].

Characteristic of *Moniezia expansa* infection is the promptness and apparent regularity with which sheep grazing in an infested field contract the cestode. On a per diem basis, the number of worms acquired is small, as judged by *post-mortem* examination of susceptible animals which have been exposed seriatim and killed before becoming immunized. Throughout a two years' study in our field I-II, for only one brief period did this daily number definitely exceed 2 tapeworms. Comparative rates of acquisition of the parasite may be taken as reflecting changes in the amount of available pasture infestation. A rapidly rising rate as forage developed in the spring, was concomitant with increased grazing by the sheep. (During winter feeding of hay, even though the animals had the run of the pasture, infection was possible, though rare). After an interval, a rapidly falling rate appeared to evidence gradual exhaustion of the infestation, coming as it did when no tapeworm eggs had been deposited for many months in the area. A secondary rise in the rate, as the season advanced, was subsequent – after a lag period – to new contamination of the field. In a year when there was no interruption of the recontamination of pasture by active infections, there was no evidence of temporary exhaustion of the infective stages. The picture developed was a consistent one, in which duplicate animals at various exposure periods furnished confirmatory observations.

WINFIELD, G. F., & CHANG, C. F. (1936). **Raillietina (Raillietina) sinensis a new Tapeworm from the Domestic Fowl.**—*Peking Nat. Hist. Bull.* **11.** 35-37. 3 figs. [2 refs.] [In English]. [Copied *verbatim* from *Int. Rev. Poult. Sci.* **10.** 108].

This species, collected once at Tsinan, differs from most other species in that it has 43 to 57 testes that measure 0·028 mm. in diameter, a cirrus sac 0·198 mm. long and the ovary 0·048 mm. by 0·129 mm. Each uterine capsule contains 1 to 5 eggs.

I. RITCHIE, L. S. (1936). **The Specific Validity of the Human and Pig Ascaris, Based on a Comparative Study of Spermatogenesis and Oogenesis.**—*J. Parasit.* **22.** 536.

II. CLAPHAM, Phyllis A. (1936). **Preliminary Observations on the Infectivity of *Ascaris lumbricoides* to Swine.**—*J. Helminth.* **14.** 229-232. [5 refs.]

III. CAMPBELL, D. H. (1936). **An Antigenic Polysaccharide Fraction of Ascaris lumbricoides (from Hog).**—*J. infect. Dis.* **59.** 266-280. 4 tables. [10 refs.]

IV. CHITWOOD, B. G. (1936). **Observations on the Chemical Nature of the Cuticle of *Ascaris lumbricoides* var. *suis*.**—*Proc. helminth. Soc. Wash.* **3.** 39-49. 2 tables. [Numerous refs.]

V. BIESTER, H. E., & EVELETH, D. F. (1937). **Blood and Tissue Studies in Experimental Acariasis.**—*Amer. J. Hyg.* **25.** 135-140. 1 table. [10 refs.]

I. An abstract of a conference demonstration on the morphological study of the human and pig ascaris by means of a detailed comparison of spermatogenesis and oogenesis. Both were studied in detail and observations were made to indicate that the stages of gametogenesis are strikingly similar in the two species.

II. Infestation of pigs with *A.l.* is brought about more consistently by feeding small and repeated doses of ova than by massive single doses, and the risk of fatal pneumonia is lessened. Four pigs, 11 weeks old, fed with 200 ova twice daily for ten days, and one pig, nine weeks old, fed with 200 ova once daily for the same period, all became infested.

III. C. describes the isolation of a polysaccharide from *Ascaris lumbricoides* (hog), its purification and its chemical properties. Precipitin, skin and anaphylactic tests were carried out on rabbits and g. pigs, and the results indicate that the polysaccharide is capable of specifically inducing the formation of specific antibodies as well as reacting with them to give specific test reactions.

The results indicate the immunological significance of polysaccharides from animal parasites, and also suggest an ample source of supply.

IV. C. reviews the literature and details his tests and analytical experiments. The cuticle was found to be composed of five substances separated by physical and chemical means :– (1) albumins ; (2) probably a glucoprotein – neither of these two corresponded to known morphological entities ; (3) a fibrous tissue for which the term " matricin " is proposed ; (4) a member of the collagen group, for which the term " ascarocollagen " is proposed, and (5) a keratin.

V. In a controlled experiment embryonated ova of *Ascaris suum* were fed to five pigs and the liver pathology and the blood chemistry were studied during the next 14 days. It is suggested that much of the connective tissue commonly seen in the livers of swine is due to parasitic infestation. The blood showed a rise of inorganic phosphorus, a rise, followed by a fall, in blood sugar and a fall of urea nitrogen, with a simultaneous rise in amino-acid nitrogen. The morphology of the pancreas was unchanged.—E. E. JELBART.

PHILIPTCHENKO, A. A., & DANSKER, V. N. (1935). **On Epidemiology of Ascariasis.** —*Trans. Pasteur Inst. Epidemiol. bact. Leningr.* **2.** 123-147. [In Russian: English summary pp. 229-231]. [Copied *verbatim* from *Helminth. Abstr.* **4.** 208].

Philiptchenko and Dansker find that undeveloped eggs of *Ascaris lumbricoides* can withstand very low temperatures and considerable fluctuation of temperature. They are, however, much more susceptible to such changes when they have developed to the infective stage. Desiccation soon proves lethal to all eggs.

I. FOSTER, A. O., & CLARK, H. C. (1937). **Verminous Aneurysm in Equines of Panama.**—*Amer. J. trop. Med.* **17.** 85-93. 9 figs. on 3 plates, 2 tables. [12 refs.]

II. FOSTER, A. O. (1937). **A Relationship in Equines between Age of Host and Number of Strongylid Parasites.**—*Amer. J. Hyg.* **25.** 66-75. 4 tables, 1 graph. [5 refs.]

III. BRITTON, J. W. (1937). **Studies of the Diagnosis of Equine Strongylosis, with Special Reference to Fecal and Blood Examinations.**—*Cornell Vet.* **27.** 290-296. [14 refs.]

I. P.M. studies on 202 equines in Panama revealed active verminous arteritis or aneurism due to *Strongylus vulgaris* in 161 cases. Arterial infestation was found in two out of five foals under one month old. The nature of the lesions and their reputed and probable effects are discussed.

II. At autopsies on 86 government department equines in Panama (59 aged 9-15 years, and 27 over 15 years old) studies – as regards species, number, habitat and age of host – made of the worm burdens, showed that, in general, the younger group were more than twice as heavily infested with strongylid parasites as the older group. This is interpreted as an age resistance, but it did not operate as regards *S. vulgaris*, which were equally numerous in both classes, as also were stomach worms.

III. In P.M. examinations of 36 horses, verminous aneurisms were found in 27, of which only ten showed eosinophilia, and the average egg count in the horses under eight years was nearly double that in horses over eight. Of 1,034 *S. vulgaris* found, the sex ratio was 3·34 females to one male. Eosinophilia appears to indicate verminous aneurisms, but is not a symptom.

Stoll's egg counting technique is applicable to equine strongylosis. There was a greater tendency to variation in egg counts in young than in old horses.

—E. E. JELBART.

ARREZA-GUZMAN, A. (1937). Recherches expérimentales sur le traitement de la strongyloïdose murine. [**Treatment of Strongyloides Infestation in Rats**]. —*Ann. Parasit. hum. comp.* **15.** 125-145. [Numerous refs.]

White rats were infected with *S. ratti* by bathing them for about 90 minutes in water containing infective larvae and kept at 30°C. to ensure their motility. The rats were kept on raised wire-floored cages, Brumpt's method of culturing eggs to an infective larval stage being used.

By means of eggs counts from rat faeces, controls being used, A. tested the following preparations :– pyrethrum oil and another pyrethrum extract which was less stable than the oil, gentian violet, thymol, oil of chenopodium, tetrachlorethylene and glycerin. All proved very toxic for strongyloidosis in the rat. By *in vitro* experiments thymol and oil of chenopodium were proved most active, results were doubtful for tetrachlorethylene, and the pyrethrum and gentian violet preparations were without effect.—C. V. WATKINS.

SHTCHOUPAKOV, J. G. (1935). **On the Possibility of Reinfection of Muscle Tissue with *Trichinella spiralis*. (On the Question of Immunity in Trichiniasis).** —*Trans. Pasteur Inst. Epidemiol. bact. Leningr.* **2.** 153-162. [In Russian: English summary pp. 231-232]. [Copied *verbatim* from *Helminth. Abstr.* **4.** 208. Signed P. A. C.]

Shtchoupakov finds that in trichiniasis there develops an immunity within the muscles as well as one in the intestine. Rats were re-infected with trichina and during the first few days there was a high mortality. This was probably caused by chemical changes in the intestinal media as a result of the first infection. A few which reached sexual maturity produced embryos, the majority of which perished before they could penetrate the circulatory system. Even if they succeeded so far in the life cycle, very few were able to penetrate the muscles unless the first infection was too light to cause an immunity.

IAMANDI, G. G., & TECLU, M. (1937). L'ophtalmie vermineuse des ruminants en Roumanie. [**Verminous Ophthalmia of Cattle in Rumania**].—*Ann. Parasit. hum. comp.* **15.** 330-332. 1 table.

Cattle, buffaloes, sheep and goats were examined at various abattoirs. 507 out of 2,354 animals were carriers of *Thelazia rhodesii*, and 156 showed lesions. 15% of the larger ruminants and 10% of the smaller were infested. The common site is the conjunctival cul-de-sac.

The symptoms depend on the age and degree of infestation. Recent slight infestations do not interfere with the health of the animal. Symptoms increase between spring and autumn. Apart from the eye, the parasite was found in the lacrymal duct and in the nasal cavity. Embryos were not found in the blood stream.

The life-history has not been determined. It is probable that diptera act as vectors and intermediate hosts.

Local application of thymol in glycerin 1 : 150 is recommended.—F. H. M.

BROWN, H. W. (1937). **Some Observations on the Epidemiology of the Dog Heart Worm** (*Dirofilaria immitis*).—[Copied *verbatim* from *J. Parasit.* **23.** 570].

Examination of dogs for *Dirofilaria immitis* were made in rural and urban areas in and about Savannah, Georgia. The examinations disclosed that *Dirofilaria* was present in as many as 80 per cent. of the dogs in certain areas. Studies made on the type of dog most commonly infected indicate that the usual text-book statement of a higher infection rate among short haired dogs than long haired dogs does not hold for the region studied. Observations were made on the development of the *Dirofilaria* microfilariae in dog fleas.

IMMUNITY.

DOUGLAS, A. (1937). **The Control of Tuberculosis by means of the Tuberculin Test.**—*Vet. Rec.* **49.** 1129-1141.

D. briefly outlines the technique of the intradermal tuberculin test and the character of the reactions obtained. He is of the opinion that practically all marked variations from the firm, typical circumscribed nodule of the non-reactor should be regarded as positive. There is, however, a doubtful reaction characterized by a firm, well-defined nodule measuring from 12-15 mm. in the average skin with little or no oedema. These doubtful cases may usually be classed as atypical

reactors in an infected herd, but it is difficult to explain their significance in herds which have been free from infection for some years, especially in view of the fact that some of them do not react to a subsequent test. These doubtful reactions have been more frequently encountered since it has been the practice of the author to test all the animals in the herd as is required by the orders of the Tuberculosis (Attested Herds) Scheme and they have been found chiefly in young animals. In view of the fact that there is no adequate explanation for the occurrence of such reactions, D. considers that the animals should be treated as infected, and eliminated from the herd. D. mentions the procedures necessary for the elimination of the disease, dependent on the original degree of infection, and he especially stresses the importance of establishing a self-contained herd for the maintenance of disease-free stock.—S. J. Edwards.

I. Vass, I. (1937). A szarvasmarhák nyilt gümőkórjának irtása. [**The Eradication of Open Tuberculosis in Cattle**].—*Állatorv. Lapok.* **60.** 26-31.

II. Manninger, R., & Buzna, D. (1937). A synthetikus tuberkulinról. [**On Synthetic Tuberculin**].—*Ibid.* 135-136. 1 table. [3 refs.]

III. Mócsy, J. (1937). Az intrakután tuberkulinpróbáról. [**The Intradermal Tuberculin Test**].—*Ibid.* 215-220. 2 figs., 1 table, 1 graph.

I. In the last decade bovine TB. has increased appreciably in Hungary. Whilst the percentage of reactions to tuberculin between 1910 and 1913 varied between 10·3 and 13·4, in the years 1930-1931 it was 27·9 to 35. A state voluntary control method on the lines of Bang's system was inaugurated in 1930 and by 1933, 106 herds containing 15,319 cattle (1 % of all herds in Hungary) were enrolled. Twenty-nine of these herds with 4,416 cattle were TB.-free. In order to control the disease in herds not enrolled in the scheme, veterinary police measures are in existence by which the owner is obliged to report suspected cases and cases of open TB. have to be slaughtered (with state compensation) or to be strictly isolated. This system has not given good results and V. suggests that it is advisable to have the most heavily infected herds clinically examined for open TB. annually by district veterinarians.

II. Of the three synthetic media for the preparation of tuberculin – those of Henley, Long and Sauton – the authors prefer the first named. Tuberculin prepared on this medium from a bovine type bacillus gave good results in three heavily infected herds containing 150 cattle and it was as efficient as " old " tuberculin prepared from the same strain.

III. From great experience in the voluntary TB. control scheme, M. considers that the single intradermal test is more reliable than the subcutaneous test and that it gives fewer erroneous results in emaciated animals. Technical details of the intradermal test are discussed. M. advises that the results should be read after 72 hours and not after 48 hours, at which period non-specific swelling due to protein in the tuberculin may still be present. The double intradermal method has no advantage over the single because the second injection prolongs any non-specific reaction which may have developed.—G. Sàlyi (Budapest).

Coulaud, E. (1936). Allergie réalisée avec des bacilles tuberculeux et morveux morts, enrobés dans la paraffine. Pouvoir vaccinant des bacilles de Koch ainsi préparés. [**Allergy Produced with Dead** *Mycobacterium tuberculosis* **and** *Pfeifferella mallei* **Mixed with Paraffin. Effect of Vaccination with Tubercle Bacilli thus Prepared**].—*Bull. Acad. Méd. Paris.* **115.** 232-235. [11 refs.] [See also *V. B.* **8.** 132].

The author injected rabbits and g. pigs with *M. tuberculosis* killed at 120°C.

and mixed in hard paraffins with melting points between 38° and 56°C., in the proportion of 10 mg. in 1 c.c. Thorough mixing was ensured by boiling the paraffin (after admixture) for 5-10 minutes and subcutaneous injections of 0·5 c.c. were made at about 50°C. into the regions of the head of rabbits and of the neck of g. pigs. The inoculum hardened quickly but started to soften about 30 days later, when the animals commenced to react to tuberculin in a degree comparable to that obtained after the injection of living virulent bacilli. Allergy persisted for years, even after excision of the vaccinal reaction, probably through the dispersion of microscopic fragments of the inoculum throughout the body. The latter risk makes this form of vaccination unsuitable for human use.

Similar experiments were made with mallein in paraffin, except that the mixture was not heated above 70°C., and allergy developed in 1-3 months.
—C. V. Watkins.

Rich, A. R. (1937). **Studies on the Dissociation of Hypersensitivity from Immunity.**—*Rev. Immunol.* **3.** 25-49. [Numerous refs.] [In English: French summary].

R. shows, by his own recent experimental findings and those of numerous other workers, that acquired immunity is not dependent upon hypersensitivity. This evidence embraces work on a variety of infections (tuberculosis and syphilis and pneumococcal, streptococcal, staphylococcal and pasteurella infections). On the contrary he shows that a hypersensitive state usually leads to an exaggerated inflammatory response to infection, with a consequent greater destruction of tissue. Immunity can be established without hypersensitivity. Passive transfer of immunity from an immune, hypersensitive animal can be made without transference of the hypersensitivity. Desensitization, in such conditions as food sensitivity, hay fever and serum sickness, leaves the immunity intact. Allergic inflammation, as a reaction about bacteria after they reach the tissues and in the absence of immunity, neither hinders the spread of the bacteria nor protects against the infection. The latter effects are primarily due to the immobilizing and opsonizing power of antibody in an immune animal. Studies with pneumococci and pasteurella bacteria showed that when these were mixed with antibody before injection they were sharply localized at the site of injection within a few minutes, whereas if mixed with normal serum they spread freely from the site although causing more inflammatory reaction than in the case of the antibody mixture. In his discussion R. suggests that neither the theory nor the methods of desensitization are at present satisfactory. A safe and efficient method will not only offer great therapeutic possibilities for such conditions as tuberculosis, but its correct interpretation may show whether there are any conditions in which hypersensitivity may play a beneficial role in bacterial infections. In conclusion he states that there has never been one single experiment or observation placed on record through which hypersensitivity has been shown to be necessary for protection in any stage of any infection in any circumstances.—C. V. Watkins.

Křivinka, J. (1937). Hodnocení aglutinačních zkoušek při tlumení pullorové nákazy. [**The Agglutination Test for Pullorum Disease**].—*Zvěrolék. Rozpravy.* **11.** 57-60, 61-69 and 73-81. 5 tables. [Numerous refs.] [German summary].

K. examined the blood of 3,502 hens by the slow and rapid aggl. tests. 717 positive results were obtained by using the slow method and only 461 by the rapid method. Tests were made with dried blood. A drop of the blood is placed on filter paper and allowed to dry; for testing this is extracted in salt solution and a

suitable dilution is made. The results, however, were only correct in 28% of the tests. K. says that the blood of hens affected with *Salmonella gallinarum* may give a positive reaction to *S. pullorum* and that the only reliable method for the diagnosis of pullorum disease is the slow aggl. test.—E. Přibyl (Brno).

Mudd, S., Czarnetzky, E. J., Pettit, H., & Lackman, D. (1937). **Labile Bacterial Antigens and Methods of Preparing and Preserving Them.**—*Publ. Hlth Rep., Wash.* **52.** 434-436. [15 refs.]

The labile surface antigen of *Streptococcus haemolyticus* can be isolated by three different methods, each depending on disintegration of the bacilli :– (1) a dense suspension is disintegrated by sonic vibrations of audible frequency ; (2) the organisms are dried *in vacuo* and ground in a mortar in the presence of liquid air, and (3) the organisms are dried *in vacuo* and ground in a ball mill. Whichever method is used, the residue is suspended in saline, centrifuged, and the supernatant candled. The solution is made slightly acid ; the antigen flocculates and is recovered by centrifugation. The sediment is soluble in normal saline solution and is capable of removing type-specific antibody from immune rabbit serum. If kept in the cold, or heated to 56°C. for one hour, the antigen is oxidized and loses its combining properties. These can be restored by reducing the substance with cysteine or thioglycolic acid.—A. Wilson Taylor.

Foshay, L. (1936). **The Nature of the Bacterial-Specific Intradermal Antiserum Reaction.**—*J. infect. Dis.* **59.** 330-339. 5 tables. [6 refs.]

Specific skin reactions are produced by the intradermal injection of 0·04 c.c. of specific antisera into persons suffering from specific homologous infections. Injections of normal sera or antisera, homologous to the animal of origin, but heterologous as to the antibody, fail to produce reactions in persons not previously sensitized to the sera proteins. These phenomena being constant in tularaemia and several other infectious diseases, a study of the factors involved was undertaken. The reaction was found to be of the antigen-antibody type involving only the species-specific polysaccharide. The specific antibody fraction was adsorbable when filtered through aluminium hydroxide, silicate, Fullers' earth or kielselguhr. This was determined for anti-tularaemia serum, anti-brucella serum, various anti-streptococcal sera (prepared from horses and goats) and for anti-tuberculosis and anti-staphylococcus sera prepared from goats. The same, or a similar mechanism, is responsible for identical type bacterial specific reactions in certain other infections.

The skin reaction serves as a confirmatory test of great accuracy ; the differentiation of the type or strain of organism being possible in certain diseases. In some infections, conferring a prolonged immunity, reaction will occur many years after recovery, but the test will not distinguish between present and passed infections.

Immune persons may be distinguished by this test from susceptible persons. The greatest use of the test may probably be to indicate which polyvalent anti-streptococcal serum is likely to be the best for a given person. The serum should be strictly species-specific and is best made by using only recently isolated and virulent strains. Commercial sera are not regarded as reliable for the test. Strictly normal sera must be used simultaneously as controls. Further work is desirable to determine if the differentiation is invariable or whether group reactions may not be produced in some cases.—H. E. Bywater.

I. Ramon, G., Bocage, A., Richou, R., & Mercier, P. (1936). Étude sérologique et clinique de l'immunité dans l'anatoxithérapie staphylococcique.

Résultats - conséquences. [**Immunization with Staphylococcus Anatoxin**]. —*Rev. Immunol.* **2.** 551-565. 4 tables. [11 refs.]

II. Ramon, G., Gernez, C., Richou, R., & Pannequin, C. (1936). Recherches sur le développement de l'immunité antitoxique et sur les conditions optima de l'immunisation dans l'anatoxithérapie staphylococcique chez l'homme. [**Immunization against Staphylococcus with Anatoxin**].—*Ibid.* 566-579. 14 tables. [12 refs.]

III. Nélis, P. (1937). Essai comparatif de production d'antitoxine staphylococcique au moyen de deux anatoxines de pouvoir antigène très diffèrent. [**Production of Staphylococcus Antitoxin by Means of Two Anatoxins of Different Antigenic Power**].—*C. R. Soc. Biol. Paris.* **125.** 128-130. 2 tables. [2 refs.]

I. This article summarizes the vast application of anatoxin therapy for staphylococcal skin infections, the importance of the antitoxin immunity so produced and the clinical evidence obtained (with over 1,000 titrations of antitoxin in the sera of about 500 human patients at various stages of the treatment) during the last two years.

The authors show that an anatoxin of a titre of at least 10 units given in several doses at 4-5 day intervals gives better results than a less potent and diluted anatoxin.

II. The authors show by tables the varying production of staphylococcal antitoxin in man according to dosage, the titre of anatoxin used and the spacing of the doses. The antitoxin immunity begins to develop 5-7days after an injection of anatoxin, attains its maximum at the 12th-30th day and then gradually declines to a level always above the initial titre.

The admixture of T.A.B. vaccine to staphylococcus anatoxin caused a stronger staphylococcus antitoxin response than a similar dose of anatoxin alone.

III. N. injected rabbits over a period of several weeks with three increasing doses of staphylococcus anatoxin, using four samples containing less than 0·5 anatoxin units (A.U.) per c.c. by flocculation and fixation tests and one sample containing 8 A.U. The average A.U. for four rabbits when tested 15 days after the injections of the low titre anatoxins was 3·75 A.U. and for three rabbits injected with the high titre anatoxin it was 6·1 A.U.

This experiment and another which is detailed show that a very weak anatoxin may be a powerful antigen for the rabbit.—C. V. Watkins.

Laigret, J., & Durand, R. (1936). Technique de la préparation des vaccins enrobés dans le jaune d'oeuf. [**Technique of Preparation of Vaccines in a Base of Egg Yolk**].—*Arch. Inst. Pasteur Tunis.* **25.** 570-576. [8 refs.]

Yellow fever virus was attenuated by intracerebral mouse passage. The infected nervous tissue was then incubated in glycerin for 20 hours, ground up with a mixture of anhydrous sodium hydrogen phosphate and sodium dihydrogen phosphate and the resulting mixture dried in a desiccator. The powder thus obtained was titrated by the intracerebral inoculation of mice and was then mixed with an equal part of the phosphate preparation; egg-yolk was added slowly and the whole was worked into a smooth cream which was then dried in a desiccator. The various procedures must be carried out with all the precautions necessary to ensure sterility. The egg-yolk conserved the virus in an active state for many months.—E. J. Pullinger.

Descazeaux, M. (1937). Les vaccinations associées en médecine vétérinaire. [**The Use of Combined Vaccines in Veterinary Medicine**].—*Mouvem. sanit.* **14.** 245-258. [Numerous refs.]

A brief survey of the way in which it is possible to vaccinate against two diseases by means of a single inoculation. Thus by a single inoculation it is possible to obtain protection against *Clostridium chauvoei* and *Cl. septique* infections. Other effective combinations of vaccines are cited.—E. J. PULLINGER.

TAI, M. (1937). Experimentelle Studien ueber pernasale Immunisierung. [**Experimental Studies on Intranasal Immunization**].—*Arb. a. d. Med. Fakultat Okayama.* **5.** 253-288. 2 figs. [Numerous refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 807-808. Signed J. C. CRUICKSHANK].

With the object of studying the absorption of antigens through the nasal mucosa, horse serum in fluid form and in the form of a dried powder were applied to the nasal passages of normal rabbits and of rabbits the cilia of whose mucous membrane has been removed. Titrations of the antigen and the antibody in the blood of the animals were made. Antigen began to appear after one hour when fluid serum was used, after about two hours in the case of powder. A maximum was reached at a time varying from 1 to 5 days, and antigen could still be detected up to the 7th to 12th day. Antibodies appeared after 4 to 5 days, rose to a maximum in 8 or 10 days, and fell slowly in the next 2 or 3 months. The rise of antibodies was more rapid in the unciliated rabbits and a higher titre was attained.

PARKER, R. C. (1937). **Studies on the Production of Antibodies in Vitro.**—*Science.* **85.** 292-294. [8 refs.]

Conflicting reports have been made on the production of antibodies by animal tissues cultured *in vitro*. In some of the experiments recorded, the antigen was added to the growing tissue after removal from the animal; in others the antigen was inoculated into the animal, the tissues being removed after various intervals for culture.

P. has found that cultures of spleen tissue removed from rabbits which had been injected two and three days previously with washed g. pig red cells or with killed bacterial suspensions produced agglutinins after four days' incubation in a fluid medium. This medium contained normal rabbit serum. When spleen tissue from rabbits inoculated 1-24 hours previously was used, the results were negative even when serum from rabbits, inoculated three days previously, was substituted for normal serum.

P. concludes that the tissues require to be acted upon by some unknown mechanism in the body before they are capable of producing antibodies. —C. MCGAUGHEY.

HARDT, O. (1937). Nogle Undersøgelser over Isohaemagglutination hos Svinet. [**Investigations in Isohaemagglutination in Swine**].—*Medlemsbl. danske Dyrlaegeforen.* **20.** 402-408. 5 tables. [Numerous refs.]

Cross-agglutination tests have been performed with blood from 250 Danish pigs. It has not been possible to set up a simple system of blood types, and this is in accordance with results found by JETTMAR in swine from Manchuria [(1930). *Z. Immunforsch.* **65.** 288]. [See also *V. B.* **6.** 532].—H. C. B. (COPENHAGEN).

DISEASES, GENERAL.

ROOS, A. (1936). De vanligaste sjukdomarna hos silverräven. [**Important Diseases of the Silver Fox**].—*Suom. Eläinlääkaril.* **42.** 29-38 and 58-60.

The paper constitutes a general survey of the most common ailments in silver

foxes, especially those of parasitic origin. The necessity of good hygienic conditions and the use of elevated netting-floors in the pens, are stressed.

—GUSTAV NAERLAND (OSLO).

CHIODI, V. (1936). Brevi cenni nosografici dell'Etiopia. [**Notes on the Diseases of Ethiopia**].—*G. ital. Mal. esot.* **9.** 157-163. [14 refs.] [Abst. from abst. in *Trop. Dis. Bull.* **34.** 247].

Mention is made of trypanosomiasis (*Trypanosoma congolense*, *Tryp. brucei*, *Tryp. pecorum* and *Tryp. evansi*) in domestic animals including camels.

I. GAMBLES, R. M. (1936). **Diseases of Poultry. (With Special Reference to those Occurring in Cyprus).**—*Cyprus (agric.) J.* **31.** 12-19.

II. GAMBLES, R. M. (1936). **Diseases of Sheep and Goats. (With Special Reference to Cyprus).**—*Ibid.* 133-140.

III & IV. GAMBLES, R. M. (1937). **Diseases of Sheep and Goats. (With Special Reference to Cyprus). Part II. Diseases Caused by Animal Parasites. Part III. Miscellaneous Sporadic, Accidental, and Non-Specific Affections.**—*Ibid.* **32.** 12-18 and 49-52.

I. The articles are written primarily for the native agriculturalist.

The symptoms and treatment of the common poultry diseases are briefly described. The commonest disease is probably fowl pox, but many poultry diseases are encountered. Insanitary conditions and the fact that the birds are not usually penned are factors to be overcome before heavy losses can be prevented.

II. There are about three quarters of a million sheep and goats on the island. The most important diseases are anthrax, sheep pox and parasitic gastro-enteritis.

The symptoms, lesions and methods of control of the more important bacterial and virus diseases are given. Anthrax has greatly diminished recently, due mainly to the annual vaccination campaign. Sheep and goat pox are distinct diseases although similar in appearance.

Malta fever, which was introduced with imported goats, has apparently been stamped out.

III. The life-history, symptoms, and control of the common parasitic diseases are given. Piroplasmosis has now been recorded. Parasitic gastro-enteritis causes heavy losses, *Haemonchus*, *Ostertagia* and *Taenia* being the principal causal worms. *Coenurus cerebralis* has not been recorded, nor has sheep scab. *Oestrus ovis* is a great nuisance in the summer. Dipping tanks have been erected in many villages.

IV. Causes, symptoms and treatment of common diseases not mentioned in the three previous articles are briefly given. Mastitis is quite common. Sumach poisoning is common. [Several cases of poisoning by *Sorghum halepense* were recorded between 1930 and 1934.—F. H. M.].—F. H. MANLEY.

ANON. (1937). **Mortality. [At Laying Trials].**—*Harper Adams Util. Poult. J.* **22.** 580-590. 15 tables, 2 charts.

A death rate of 21·3% at the Harper Adams Laying Test for the year 1936-1937 is the highest yet recorded for this trial. From tables showing the percentage mortality at this trial for the past 15 years and the average mortality at all recognized trials in Great Britain over the same period it is shown that mortality has risen from an average of 5·2% during the first four years of this period to 17·7% at all recognized trials during 1936-1937. Further tables are given showing the incidence of deaths by pens, the monthly distribution of mortality, and breed mortality.

During the last three years only 30% of the pens had no deaths, 30% had not more than one death among six birds entered, while 40% had more than one death out of six. The distribution of the mortality over the various parts of the year show that with but little variation one third of the deaths occurred in the first half of the trial and two thirds in the second half. White Wyandottes showed the highest mortality, followed by White Leghorns, with Rhode Island Reds third.

The second part of the paper deals with the causes of death, and the reports on the P.M. examination of the birds which died at the Harper Adams Laying Trial during 1936-1937.

Owing to the large percentage of birds in which more than one condition was found on P.M. examination no attempt has been made to summarize the deaths under various diseases, and instead, tables are presented showing the frequency with which each specific condition is mentioned in the reports. The outstanding feature of the list is the frequency with which the presence of worms especially tapeworms, were reported, *viz*, in 66·3% of cases. The next most frequent condition found was enteritis (57%), followed by peritonitis, egg material in the abdominal cavity, and inflammation of oviduct, 25%, 21·9%, and 10% respectively. Tumours were found in 28% of the birds examined, about half of them being associated with the ovary. The incidence of lymphomatosis was 13%.—R. F. G.

I. Lesbouyries, Michel, Colle, & Berthelon. (1937). Contribution à l'étude des méningo-encéphalo-myélites du cheval. [**Diseases of the Meningo-Encephalomyelitis Group in Horses**].—*Bull. Acad. vét. Fr.* **10.** 74-83.

II. Velu, H., Zottner, G., & Miègeville, J. (1937). Les colorants azoïques dans le traitement de la paraplégie infectieuse du cheval. [**Azo Dyes in the Treatment of Equine Infectious Paraplegia**].—*Ibid.* 48-50. [5 refs.]

III. Miègeville, J. (1937). Les colorants azoiques dans le traitement de la paraplégie infectieuse. [**Treatment of Equine Infectious Paraplegia with Azo Dyes**].—*Maroc méd.* **17.** 58-59.

I. Infectious equine conditions characterized by a disordered central and peripheral nervous system have been reported from various parts of the world under a variety of names. Clinically these various diseases have much in common. The disease of this type met with in France is that known as equine infectious paraplegia.

In this article the authors record their experience of cases they have studied in France. A detailed bacteriological examination of the brain-tissue was made in two of the cases, from one of which a streptococcus was isolated. Its characteristics and reactions are given. It appeared to belong to the strangles group. There is a discussion on the pathological anatomy, aetiology and differential diagnosis of the various equine diseases falling into this category. The authors suggest that infectious paraplegia is a meningo-encephalomyelitis rather than a myelitis of the dorso-lumbar region.

II. Since a streptococcus is held to be the causal agent in equine infectious paraplegia the authors tried the effect of Prontosil-Bayer (intramusc.) and Rubiazol-Roussel (intraven.) on two cases of the disease. A short clinical record is furnished of each. A cure resulted in each case.

III. Except for a few unimportant modifications in wording, this article is the same as II above.—C. Davenport.

Bindel, L. (1937). Rola owcy w patogenezie głowicy bydła. [**Bovine Malignant Catarrh in Polesie, Poland**].—*Przegl. wet.* **52.** 476-488 and 536-541. 1 table. [Numerous refs.]

During four years B. observed 52 cases of bovine malignant catarrh in 44 different farms in Polesie. There had been contact between cattle and sheep on 34 of these farms.—A. SZWABOWICZ (LWÓW).

MACEK, K. (1937). Chřipkové onemocněni u skotu. [**Influenza (Infectious Bronchitis) in Cattle**].—*Zvěrolék. Rozpravy.* **11.** 23-24.

M. infected small animals by the injection of a filtrate prepared from the brain-tissue of affected cattle. Bacteria isolated from the organs were considered only to be secondary invaders. The main lesions found on P.M. examination are bronchitis, peribronchitis, catarrhal pneumonia, interstitial and sub-pleural emphysema, and acute or chronic enteritis. In M's opinion the name influenza is preferable, since bronchitis is only one item in the syndrome.—E. P. (BRNO).

STENIUS, P. I. (1937). Ueber eine unter dem Bilde der Schrumpfniere verlaufende schwere Hypoplasie der Nierenrinde beim Schwein. [**Kidney Hypoplasia in Swine**].—*Dtsch. tierärztl. Wschr.* **45.** 289-292. 1 fig. [4 refs.]

A case record of hypoplasia of the renal cortex of both kidneys in a number of healthy swine killed for food. Otherwise the kidneys were normal and showed no sign of inflammation either macroscopically or microscopically.

—G. HARTMANN (VIENNA).

LÁSZLÓ, F. (1937). Adatok a sertésvese kórbonctanához. [**Kidney Diseases of Swine**].—*Állatorv. Lapok.* **60.** 4-6. [Also appeared in *Dtsch. tierärztl. Wschr.* **45.** 307-310].

A record of kidney diseases seen at meat inspection. Material from 60 cases was examined histologically. In 34 cases there was cloudy swelling – with acute glomerulitis in 7 cases; 3 cases of acute interstitial nephritis were observed, 6 of tuberculosis, 11 of chronic interstitial nephritis, 4 of chronic glomerulitis, 2 of pyelonephritis, one of renal leucosis and 5 of neoplasms.—G. SÁLYI (BUDAPEST).

CRAWFORD, H. C. (1937). "**Recurrent Ophthalmia**".—*Vet. Ext. Quart. Univ. Pa.* **37.** No. 67. 13-15.

C. propounds that recurrent ophthalmia indicates an acute auto-intoxication-organic demineralization syndrome – infection playing a minor role. The hereditary predisposition is to organic demineralization and not to specific infection. Organic demineralization displays a predilection for gland substance, and in many of the cases examined by C. there was tumefaction of the lymph nodes of the parotid gland.—E. E. JELBART.

MITCHELL, J. F. (1937). **Renguera.**—*J. Amer. vet. med. Ass.* **91.** 176-181. 2 figs. [2 refs.]

Renguera, as described here, appears to be a mixture of at least two distinct diseases. Transmission experiments showed the presence of a neurotropic virus of the "louping-ill" type while other evidence pointed to sway-back as the cause. It seems probable that both these diseases are present but have not been differentiated. No detailed pathology is given and there is no mention of controls in the transmission experiments. A number of drugs were used to cure affected lambs, but from their very diversity it appears doubtful whether any specific action can be attributed to their action on these cases. Reference is made to old literature on renguera, but INNES' recent work on sway-back has been overlooked [*V. B.* **7.** 131.].—P. S. WATTS.

JOLLY, P. (1937). Contribution à l'étude de l'ostéopathie hypertrophiante (syndrome de Cadiot et Ball) chez les carnivores domestiques. [**Hypertrophic Bone Disease in Dogs and Cats**].—*Thesis, Lyons.* pp. 87. 6 figs. [Numerous refs.]

The disease is generally considered to be of tuberculous origin, but actually it has often been found that animals affected with it do not react to tuberculin, nor can the tubercle bacillus be isolated from them either P.M. or during life. On the other hand, the affection is often associated with both tuberculous and other chronic pulmonary lesions as well as with neoplasms of various kinds. The symmetry of the bone lesions, their commencement at the extremities of the limbs in dependent regions and the chronic oedematous changes constantly noted at that level, point to an origin associated with circulatory disturbance the nature of which is explained by the work of LERICHE and POLICARD [(1926). Les problèmes de la physiologie normale et pathologique de l'os. Paris : Masson et Cie]. The most suitable name for the affection is considered to be Cadiot's syndrome.—G. W.

HAUSMANN, W. (1937). Bericht über die vom Volksgesundheitsamte eingeleiten Erhebungen über den spontanen tierischen Kropf. [**Goitre in Animals in Austria**].—*Wien. tierärztl. Mschr.* **24.** 545-552. [Num. refs.]

A valuable review on naturally occurring goitre in animals, particularly in Austria and Switzerland, and a record of a study on its incidence in Austria, based on a questionnaire sent to veterinary practitioners and others. The results are not given systematically and it is merely stated that reports were received of goitre in horses, cattle, swine, goats, dogs, nutria and parrots. It is hoped to continue the enquiry.—J. E.

I. HARVEY, W. F., DAWSON, E. K., & INNES, J. R. M. (1937). **Debatable Tumours in Human and Animal Pathology. I. Lymphoepithelioma.**—*Edinb. med. J.* **44.** 549-556. 19 figs. on 3 plates. [Numerous refs.]

II. DAWSON, E. K., INNES, J. R. M., & HARVEY, W. F. (1937). **Debatable Tumours. II. Lymphosarcoma.**—*Ibid.* 645-652. 2 text figs., 29 figs. on 3 plates. [Numerous refs.]

I. Over 13,000 specimens of debatable tumours have been studied. Each type is dealt with under four headings, *viz* definition, description, discussion and relevant literature. Lymphoepithelioma is defined as a radio-sensitive tumour in which lymphoid tissue is intimately associated with an immature squamous or epidermoid type of malignant neoplasm. It occurs in tonsillar tissue, nasopharyngeal mucosa and less commonly in the thymus. Metastases occur in the lymph nodes, but have also been reported in the lungs, liver and bone. After a discussion, the authors suggest that the term " epidermoid carcinoma " is most suitable. In differentiating these tumours from lymphosarcomata, the age of the subject must be considered. Many so-called lymphoepitheliomata are really reticulum cell sarcomas, *i.e.*, lymphosarcomata.

II. Lymphosarcoma or reticulum cell sarcoma is a radio-sensitive tumour of lymphoid tissue arising from the embryonal stem cells of that tissue. Instead of the germinal centres, pulp cords and sinus of normal lymphoid tissue, there are more uniform and uniformly dispersed cells always larger than the small lymphocyte. The presence of mitosis is invariable and characteristic. These tumours occur in the lymph nodes and lymphoid tissues. The architecture and cytology of lymphoid tissue are discussed and it is concluded that lymphosarcoma is a malignant tumour growth of the progenitor cells of lymphoid tissue. It can be differentiated from Hodgkin's lymphadenoma by the presence of mitosis and the rarity of giant

cells and eosinophile leucocytes. It is pointed out that genetically the endothelium and reticulum cells of the germinal centres, sinuses and pulp are identical and therefore it is unnecessary to separate lymphosarcoma from lymphoendothelioma. True endotheliomata are really angioblastomata.—C. McGaughey.

Olesen, R., & Hampton, B. C. (1937). **Seasonal Patterns and Trends of Communicable Diseases.**—*Publ. Hlth Rep., Wash.* **52.** 609-616. 7 charts.

By plotting weekly morbidity returns for various specific diseases and repeating this process for several years, graphs may be obtained which present a general impression of the average seasonal trend of incidence of these diseases. Thus in the U.S.A. it was found that the lowest incidence of diphtheria was between July and August and the highest in November, whilst the lowest incidence of typhoid fever was between December and January and the highest between July and October. Some diseases such as measles have a high incidence for a short period only, whilst others such as meningitis have a high incidence which lasts many months. Properly devised graphs of this type are of considerable value in studying the epidemiology of diseases, but for their construction very accurate morbidity returns are required, such as are seldom available in the case of domestic animals.
—E. J. Pullinger.

von Ostertag, R. (1936). Droht den Menschen eine Gefahr der Uebertragung der Diphtherie, des Typhus und des Scharlachs von den Tieren? [**The Possibility of the Transmission of Diphtheria, Typhoid and Scarlet Fever from Animals to Man**].—*Med. Welt.* **10.** 1425-1428.

The author reviews the literature and gives his opinion as to whether human diphtheria, human typhoid and scarlet fever are transmissible to domestic animals and so whether the latter are a potential danger to mankind.

Many reports of the finding of "genuine diphtheria bacilli" in domestic animals have appeared and in some cases the bacilli found have been shown to be pathogenic for laboratory animals. In horses they have been found in open wounds and in cases of strangles. He considers, however, that Koch's postulates have not been fulfilled in these investigations and, therefore, that animals cannot be regarded as vectors of human diphtheria.

With regard to human typhoid he cites one case record of experimental infection in sledge dogs in Greenland. It was concluded that dogs might harbour and excrete *Salmonella typhi* if they have access to infected human faeces.

Records of the spread of scarlet fever by milk are common, milk being contaminated by infected dairy workers. The infection of animals with scarlet fever streptococci is not common, but cases of udder colonization by the organism are on record. In any case the prevention of scarlet fever outbreaks due to milk is a matter of milk control legislation. He outlines the German regulations.—J. E.

Rigg, T., & Askew, H. O. (1936). **Further Investigations on Bush-Sickness at Glenhope, Nelson, New Zealand.**—*Emp. J. exp. Agric.* **4.** 1-5. 1 fig., 1 plate, 1 table. [5 refs.]

The value of drenching "bush sick" sheep with soil and acid extracts of soil from the Nelson district has been confirmed. The authors suggest that the iron content alone is not responsible, but that there are other beneficial constituents such as cobalt, nickel, copper, etc., which may have some effect.—C. S. M. H.

I. Seifried, O. (1937). Zur Histogenese der Veränderungen bei A-Avitaminose. [**Histogenesis of Changes in Avitaminosis A**].—*Dtsch. tierärztl. Wschr.* **45.** 450-451. [Numerous refs.]

II. Claussen. (1937). Zur Histogenese der Veränderungen bei A-Avitaminose. [**Histogenesis of Changes in Avitaminosis A**].—*Ibid.* 451. [5 refs.]

III. Hart, G. H., & Guilbert, H. R. (1937). **Symptomatology of Vitamin-A Deficiency in Domestic Animals.**—*J. Amer. vet. med. Ass.* **91.** 193-200. 1 fig. [14 refs.]

I. This is a reply to Claussen [*V. B.* **8.** 173]. According to S. and various other workers, the essential change consists in a degeneration of both the surface and glandular epithelium of the digestive tract and its replacement by epithelium of squamous type (metaplasia). At the same time, an inflammatory reaction often occurs in the sub-mucosa, due probably to secondary bacterial infection. Similar changes occur in the eye and in the epithelium and glands of the respiratory and genital tracts.

II. C. replies to the above criticism, maintaining that the earliest changes occur in the glandular epithelium, and not in the surface epithelium, as described by S. On other points, both workers seem to be in agreement.

III. This is for the most part a review of the literature, but includes an account of the authors' observations on vitamin A-deficiency in cattle.

In calves kept on a vitamin A-deficient diet, blindness developed. After a period of cod liver oil administration vision returned although it was obviously defective in dim light; it could not be cured by vitamin A administration, and was apparently due to degeneration of the optic nerves. A bull deprived of vitamin A became permanently blind and had frequent convulsions, but later recovered sufficiently to impregnate successfully six heifers.

Vitamin A-deficiency may be of economic importance in northern California under conditions of drought or unseasonable weather with their resultant scarcity of green food.—E. G. White.

I. Law, R. G., & Kennedy, A. H. (1937). Falsche Ernährung als Ursache von Blutarmut bei Nerzen. [**Nutritional Anaemia in Mink**].—*Dtsch. Pelztierz.* **12.** 161-163. 1 fig.

II. Schoop. (1937). Krämpfe und Krampfartige Zustände bei Jungsilberfüchsen. [**Cramps in Young Silver Foxes**].—*Ibid.* 166-169. 2 figs.

I. Animals receiving apparently well-balanced diets of fresh meat (60%), corn (25%), and small quantities of vegetables, milk, wheat germs and yeast have contracted anaemia. No satisfactory answer has yet been found to the question as to what proportion of liver and corn is suitable for a diet for young minks. The authors consider that the feeding of large quantities of corn to carnivorous animals, especially minks, and also any attempt to balance an excess of cereals by the addition of liver, is fraught with danger.

II. S., who breeds silver foxes, gives an account of convulsions and death of several young animals. The cause was obscure, but S. suggests that death might have been caused by sunstroke, overloading of the stomach, or faulty feeding.—M. Burke.

PUBLIC HEALTH.

I. Belle, G. (1937). État actuel de l'hygiène du lait au Maroc. [**Milk Hygiene in Morocco**].—*Maroc méd.* **17.** 216-219. 1 table. [7 refs.]

II. Canas, D. (1937). Organisation de la production du lait pasteurisé au Maroc. [**Production of Pasteurized Milk in Morocco**].—*Ibid.* 231-235.

I. Dairies in Morocco are owned by both Europeans and natives. The Europeans keep herds mainly of imported European cattle, Dutch cattle pre-

dominating; they are fed and housed similarly to cattle in Europe, but are kept continually in sheds, and so are more subject to tuberculosis than those kept in Europe. It is estimated that in Casablanca 70-80% of the European cattle are affected, whilst 2-10% excrete tubercle bacilli in the milk.

The standard of milk hygiene is very low, the milkers (natives) having little or no idea of cleanliness. Milking utensils are neither washed nor sterilized, and the milk is not cooled. Also it is frequently transported in open vessels and so the bacterial counts are very high indeed at the time of sale.

There are by-laws designed to ensure clean milk production, and demanding the veterinary inspection of cattle, but owing to lack of control over native milk producers they are inefficiently enforced.

Suggestions are made for the improvement of the milk supply.

II. Although it was shown in 1933 that a large proportion of the milk sold in Morocco was infected with organisms pathogenic to man, pasteurization of milk is not carried out to any appreciable extent. TB. and other milk diseases spread by milk are common.

In order to ensure a safe and clean milk supply the author recommends the following preliminaries:–(1) veterinary control of production; (2) medical control of milkers, and (3) laboratory control. The latter is probably the most urgent, whilst pasteurization is advocated as the best safeguard.

Pasteurization of milk is only likely to increase when the interest of the government is aroused.—H. E. Bywater.

Kessler, P. (1937). Erythema nodosum nach Masern auf den Genuss von Rohmilch. [**Erythema Nodosum Following Measles after Consumption of Raw Milk**].—*Münch. med. Wschr.* **84.** 1209. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 698. Signed J. D. Rolleston].

A record of eight cases of erythema nodosum in children aged from 4 to 7 years who all developed the eruption on the eighth day of convalescence from measles. All showed a positive tuberculin reaction. In five children an X-ray examination was made and showed enlargement of the hilus glands. As the modern view is that erythema nodosum bears some relation to tuberculosis, an enquiry was made as to the source of infection and it was found that all the children had been taking raw milk daily for several months before their attack of measles. There was no tuberculosis in any of their families. Although the milk was not examined for tubercle bacilli, Kessler had no doubt that the raw milk was the cause of the infection, especially as there had been some udder tuberculosis among the cows which furnished the milk.

Hucker, G. J., & Haynes, W. C. (1937). **Certain Factors Affecting the Growth of Food Poisoning Micrococci.**—*Amer. J. Publ. Hlth.* **27.** 590-594. 6 tables. [5 refs.]

Liquefaction of gelatin is a property common to all food poisoning micrococci. In Stone's medium, prepared by drying gelatin before use and increasing the beef extract content from 0·3% to 3%, more rapid liquefaction occurs. Of the udder flora of over 7,000 cows examined, 20% showed the presence of an orange, gelatin-liquefying micrococcus, but no toxin was produced. Certain factors appear to inhibit toxin production. The addition singly to the medium of saccharose, sodium chloride or of acetic acid reduces the growth of toxin-producing strains, while the combined action of these three substances is much more pronounced in this respect.—H. Burrow.

FINLAND. (1936). Undersökningar under året 1935 på Helsingfors stads slakthuslaboratorium. [**Report of Helsingfors Abattoir Laboratory for 1935**].—*Suom. Eläinlääkäril.* **42.** 43-44.

Bacteriological examinations were carried out on 307 cases of which bacterial infections were demonstrated in 26·8% and TUBERCULOSIS among cattle and pigs in 33 cases.—P. I. STENIUS (HELSINGFORS).

OOMS, A. (1936). Over het isoleeren van parathyphusbacillen bij het bacteriologisch vleeschonderzoek. [**Isolation of Paratyphoid Bacteria at Meat Inspection**].—*Tijdschr. Diergeneesk.* **63.** 840-846. [Numerous refs.] [English, French and German summaries].

O. advocates Müller's tetrathionate broth for the cultivation of paratyphoid bacilli in cases where the material is contaminated with other organisms. For non-contaminated material ordinary broth is a better medium. The author considers that the examination of direct smears should never be omitted.

—C. BUBBERMAN (SCHIEDAM).

I. SCHÖNBERG, F., & WIIDIK, R. (1936). Zum Wert des Brillantgrün-Phenolrotagars für die bakteriologischen Fleischuntersuchung. [**Brilliant Green-Phenol Red Agar in Bacteriological Meat Inspection**].—*Berl. tierärztl. Wschr.* May 14th. 310-312. 7 figs. 2 tables. [9 refs.]

II. BAARS, G. (1937). Die Mindestanreicherungszeit in der amtlichen bakteriologischen Fleischuntersuchung. [**The Minimal Enrichment Time in Bacteriological Meat Inspection**].—*Tierärztl. Rdsch.* **43.** 91-93. 1 table. [4 refs.]

I. A new selective medium is described for the isolation of organisms of the food-poisoning group. Its composition is as follows :– lactose 1·5%, phenol red solution (40 c.c. decinormal sodium hydroxide dissolved in 460 c.c. distilled water + 1 g. phenol red) 4%, brilliant green solution (0·5%) 1·5 c.c. per litre in nutrient agar, pH 7·2.

Staphylococci, *Proteus vulgaris* and most strains of *Bacterium coli* were completely or almost completely inhibited. Salmonella organisms, on the other hand, grew well in red or bluish-red colonies. While most non-inhibited strains of *Bact.c.* produced green colonies, some could only be distinguished by further examination. Pure primary cultures were frequently obtained from decomposing kidney and liver.

Comparative tests with other selective media demonstrated the superiority of this medium.

II. In Müller's method for the isolation of salmonella organisms from meat, a subculture from the primary tetrathionate broth culture is made on to a malachite green agar plate.

Experiments showed that if the minimum enrichment period of only seven hours is allowed (according to MÜLLER), the enrichment may be ineffective, and, if the number of organisms present is small, there may be failure to obtain growth. A minimum period of ten hours is necessary.—E. W. ASCOLI.

SARNOWIEC, W. (1936). La réaction de précipitation dans le diagnostic des infections paratyphiques des viandes. [**Precipitation Test in Diagnosis of Paratyphoid Organisms in Meat**].—*C. R. Soc. Biol. Paris.* **123.** 400-403. [1 ref.]

Precipitating sera were prepared from rabbits immunized against *Salmonella typhi-murium*, *S. enteritidis* Gärtner and *S. cholerae suis*. Extracts were made of

the muscles, liver and spleen of these rabbits and of rabbits which had been infected with live cultures of the organisms. In tests with immune serum and extracts from the immunized animals, there was little or no precipitation. Similarly with extracts made from normal rabbits there was no precipitation, but with extracts made from the infected animals there were well marked precipitates. S. suggests that precipitin tests should be used for the detection of food poisoning bacteria in meat.—C. McGaughey.

Sjölund, J. (1936). Tuberkulosdiagnosens ställande i köttkontrollen genom mikroskopering av utstryk. [**Diagnosis of Tuberculosis by Microscopical Examination of Preparations from Slaughter Animals**].—*Suom. Eläinlääkäril.* **42.** 202-204.

S. states that a thorough microscopic examination of tuberculous material from slaughter animals combined with inoculation of g. pigs gives better diagnostic results than the cultural methods.—P. I. Stenius (Helsingfors).

THERAPEUTICS.

Werdelin, C. (1936). Om Anvendelse af Chloramin og Hypochloriter til Desinfektion over for Tuberkelbakterier. [**Use of Chloramin and Hypochlorites in Disinfection against Tubercle Bacilli**].—*Maanedsskr. Dyrlaeg.* **48.** 369-375. [9 refs.]

Chloramin in concentrations of 0·05-1% did not kill tubercle bacilli present in filtrates of a saline suspension of naturally infected bovine placenta within 4 minutes, the time of exposure.—H. Berthelsen (Stockholm).

I. Colebrook, L., & Kenny, Méave. (1936). **Treatment with Prontosil of Puerperal Infections due to Haemolytic Streptococci.**—*Lancet.* **231.** 1319-1322. 4 tables, 1 chart.

II. Anon. (1937). **Therapia Sterilisans Magna.**—*Brit. med. J.* Jan. 9th. 79-80. [5 refs.]

III. Anon. (1937). **Further Work on the Chemotherapy of Streptococcal Infections in Man.**—*Vet. Rec.* **49.** 262-263. [4 refs.]

IV. Anon. (1937). **Streptococcus Infections in Animals.**—*Ibid.* 263-264.

I. A description of the treatment with red prontosil (sulphamido-chrysoidine) of a series of cases of human puerperal fever administered orally, and the soluble form – its sodium salt – (intramusc.) the dosage varying with clinical factors. The only toxic effect recorded was a mild irritation of the urinary tract. The authors comment upon the remarkable fall in death rate which can only be attributed to the clinical improvement following administration of the drug. The possibility that other factors favourably influence the findings is considered. It is concluded that prontosil treatment of haemolytic streptococcal infections is worthy of further trial.

II. A leading article referring to the recent discovery of prontosil and its application in the treatment of haemolytic streptococcal infections in man.

III. An annotation dealing with recent work by Colebrook and co-workers into the value of prontosil in the treatment of haemolytic streptococcal infection in man.

IV. An editorial referring to the relative importance of streptococcal infections in animals and the limitations of agents used to combat them.—A. L. Mullen.

McKinley, E. B., Acree, Ellen G., & Meck, Jean S. (1938). **Sulphanilamide and Virus Diseases.**—*Science.* **87.** 43-44. [3 refs.]

The authors tested sulphanilamide as a chemotherapeutic agent against poliomyelitis (in monkeys), rabbit fibroma and rabbit myxomatosis, but the results were negative, even after repeated and heavy dosage.—J. E.

Wolf, C. H., & Leskien, I. (1936-1937). Weitere Prüfungen verschiedener zum Zwecke der Galtbehandlung empfohlene Heilmittel. II. Mitteilung. Weidnerit. III. Mitteilung. Trypaflavin nach Steck. [**Tests of Mastitis Remedies. II. Weidnerit. III. Steck's Trypaflavin Method**].—*Dtsch. tierärztl. Wschr.* **44.** 870-873, and **45.** 292-295. 2 figs., 1 graph.

II. Udder infusions with "weidnerit" had no effect on streptococcal infection, and then acted as an irritant.

III. Trypaflavine was used as an udder infusion in cases of mastitis according to the technique of Steck. Thirty-six quarters were treated and as a result 25 (69 %) were freed from infection and remained so during an observation period of over three months. This result indicated that trypaflavine must be considered as one of the effective compounds of value in the treatment of mastitis.
—G. Hartmann (Vienna).

Farquharson, J. (1937). **Intravenous Use of Sodium Iodide in Actinomycosis.** —*J. Amer. vet. med. Ass.* **91.** 551-554. [5 refs.]

F. records the use of intravenous injections of sodium iodide in the treatment of actinomycosis and actinobacillosis. The dosage given is 1 oz. of sodium iodide, dissolved in a pint of sterile distilled water, per 1,000 lb. body weight. The injection is made slowly and the animal watched for a systemic reaction (manifested in about 5 % of cases) consisting of restlessness, increased breathing and heart action, and vertigo. If this appears the injection should be stopped immediately.

One treatment is usually sufficient and produces a rapid decrease in the size of actinobacillosis lesions. In the case of actinomycosis two intravenous injections at 10-14 days' interval, accompanied by surgical treatment where possible, are recommended. The method is stated to be more rapid and more certain than the usual method of oral administration of iodine or iodides. No deaths have been recorded and no symptoms of iodism occurred. One drawback is that it causes a high percentage of abortions if used in pregnant animals.—A. Robertson.

Grimpret. (1937). De l'agelaxie contagieuse. Son traitement par l'urotropine. [**Treatment of Contagious Caprine Agalactia with "Urotropine"**].— *Maroc méd.* **17.** 271-272.

A description of the symptoms, diagnosis and treatment of contagious caprine agalactia. Treatment with "urotropine" is suggested in place of "stovarsol" as it is cheaper, less toxic and more rapidly effective. A subcutaneous injection of 4 c.c. of a 10 % solution given daily for four consecutive days is stated to cure the mammary form of the condition. The arthritic form is more resistant and a second series of injections is necessary a week after the completion of the first series.

It is also claimed that injections of "urotropine" are preventive as well as curative.—A. Robertson.

Rietz, J. H. (1937). **Control of Parasites in Sheep.**—*J. Amer. vet. med. Ass.* **90.** 163-170. 1 table.

R. has tested calcium polysulphite, tetrachlorethylene, nicotine sulphate,

colloidal iodine, and copper sulphate on several groups of 20 or 30 sheep, judging the effects by observation of the egg-count in the faeces. He concludes that copper sulphate was the most useful, and recommends doses of 1-3 oz. of a 1-5% solution at intervals of three weeks throughout the year. Fasting for 24 hours before the treatment he considers to be essential.

An interesting trial was made with a mixture of powdered copper sulphate and salt given in the form of a lick; it was not successful, however; three sheep died of copper poisoning and, in general, the anthelmintic effect appeared to be very slight.—E. L. TAYLOR.

GROULADE. (1937). La fluxion périodique traitée par un colorant azoïque. [**Treatment of Periodic Ophthalmia by Azo Dyes**].—*Bull. Acad. vét. Fr.* **10.** 285-286.

A short note describing the use of an azo benzene sulphonamide dye ("zoorubiazol") in two severe cases of periodic ophthalmia in horses, with apparently excellent results.—A. ROBERTSON.

I. SEBRELL, W. H., HUNT, D. J., & ONSTOTT, R. H. (1937). **Lactaflavin in the Treatment of Canine Blacktongue.**—*Publ. Hlth Rep., Wash.* **52.** 235-239. 1 table. [9 refs.]

II. SEBRELL, W. H., ONSTOTT, R. H., & HUNT, D. J. (1937). **The Treatment of Blacktongue with a Preparation Containing the "Filtrate Factor", and Evidence of Riboflavin Deficiency in Dogs.**—*Ibid.* 427-433. 1 table. [15 refs.]

I. Five dogs were placed on a blacktongue-producing diet and when symptoms were well developed large doses of "lactaflavin" were given *per os*, but had no effect on the course of the disease. This adds further evidence to the view that "lactaflavin" is distinct from the blacktongue-preventive factor of the vitamin B complex.

II. A similar experiment using the "filtrate factor" of the vitamin B complex in place of "lactaflavin". The results suggested that the "filtrate factor" contained a considerable amount of the blacktongue-preventive factor. Some of the animals collapsed and died suddenly during the experiments though showing no symptoms of blacktongue. It is suggested that this condition may have been due to deficiency of "lactaflavin" in the diet.—A. ROBERTSON.

MILLER, M. W., & BEARSE, G. E. (1937). **The Cannibalism Preventing Properties of Oats.**—*Poult. Sci.* **16.** 314-321. 11 tables. [9 refs.]

Four trials conducted in four different years showed that when oats were fed as the sole cereal in a ration for growing and laying White Leghorn pullets, cannibalism was consistently and significantly reduced below that experienced on rations containing maize as the sole cereal. The growth value of the grain as determined at eight weeks showed oats first in every comparison followed by maize, wheat and barley respectively.—R. ALLCROFT.

POISONS AND POISONING.

PAPAVASSILIOU, M. J., & LIBÉRATO, S. N. (1936). Empoisonnement du bétail en Grèce par certains déchets industriels. [**Poisoning of Ruminants by Cotton Seed Meal**].—*J. Pharm. Chim. Paris.* **24.** 101-118. 3 tables. [Abst. from abst. in *Jber. Vet.-Med.* **60.** 537-538].

Cases of digestive disorder and dysentery occurred in cattle and sheep, which were receiving cotton seed meal in their ration. An examination of four dead sheep showed enteritis and discoloured liver and kidneys. From feeding tests of the meal on rabbits, it was established that ricin was present.

EMMEL, M. W. (1937). **The Toxicity of *Crotalaria retusa* L. Seeds for the Domestic Fowl.**—*J. Amer. vet. med. Ass.* **91.** 205-206. [2 refs.]

Both acute and chronic forms of poisoning were induced by force feeding seeds of *C.r.* to fowls. The commonest P.M. findings were ascites, necrotic enteritis, and, in acute cases, congestion of the viscera with haemorrhagic lesions; the histopathology was characterized by oedema and cloudy swelling. In chronic cases anaemia and leukopenia were observed. Since the characteristic lesions of poisoning by *C. spectabilis* (petechiae on serous membranes and a marbled liver) were not present in any of 40 birds poisoned, it is suggested that the toxic principle is different in the two species.—ALFRED EDEN.

PHYSIOLOGY.

ESPE, D. L., & CANNON, C. Y. (1937). **Gastric Secretion in Ruminants.**—*Amer. J. Phys.* **119.** 720-723. 3 figs. [6 refs.]

Three calves with Pavlov pouches in the abomasum were used to study the psychic phase of gastric secretion. The results indicate that in ruminants this phase is absent or of very minor importance. Teasing with food or sham feeding did not cause any increase in the flow of gastric secretion. It is suggested that, since small amounts of food are passed from the rumen into the abomasum at frequent intervals, such a physiological mechanism requires a relatively constant flow of gastric secretion.—N. J. SCORGIE.

COMMON, R. H. (1936). **Serum Phosphatase in the Domestic Fowl.**—*J. agric. Sci.* **26.** 492-508. 4 figs., 9 tables. [18 refs.]

Serum phosphatase values estimated on 32 normal laying White Wyandotte hens varied from 3·6 to 40·2 Bodansky units. These values were higher and more variable than those obtained from 5 cocks or from 9 pullets, but there was no great difference between laying and non-laying hens, nor any correlation between the phosphatase level and intensity of egg production.

A high initial value of 80-90 units for day-old chicks increased to a maximum of about 110 units at 10-12 days, followed by a sharp fall to 40-50 units at about 3 weeks; thereafter values for male birds fell regularly until maturity while the values for females corresponded closely with those for males until the onset of laying, when the values increased and marked individual variations developed. Administration of "radiostol" to laying birds did not reduce or affect the range of individual variation.

Two laying pullets on a low Ca ration showed a much greater increase in the serum phosphatase level during laying than two pullets receiving a high Ca diet.

The development of rickets in chicks produced a great increase in the phosphatase level, but some of the control chicks on a normal diet also showed a marked increase and signs of rickets. This may have been due to the fact that the inorganic P was lower than normal in the control group although the Ca was high.—R. A.

ORENT-KEILES, Elsa, ROBINSON, A., & MCCOLLUM, E. V. (1937). **The Effects of Sodium Deprivation on the Animal Organism.**—*Amer. J. Phys.* **119.** 651-661. 4 figs., 1 table, 2 charts. [11 refs.]

Weaned rats were put on to a low Na synthetic diet containing all other essentials of adequate nutrition, and control rats were given the same diet supplemented by Na. The growth rate was the same in both groups for eight weeks, but after that the group deprived of Na began to lose weight, and manifested characteristic eye changes, including corneal lesions, ulceration, hypopyon, haemorrhage and keratinization of the cornea. Sodium-depleted males remained fertile for at least 75-96 days, but in females the oestrus rhythm was affected and fertility declined. The changes in the eye and in the oestrus cycle were quite distinct from disturbances due to vitamin A-deficiency. P.M. examination showed all the tissues to be affected, with characteristic changes in the adrenals, while the bones were soft and easy to cut. The symptomatology differed from that in Cl deficiency and in deficiency of both Na and Cl, where growth may be retarded, but no characteristic eye and bone changes are observed.—ALFRED EDEN.

GALLUP, W. D., & NORRIS, L. C. (1938). **The Essentialness of Manganese for the Normal Development of Bone.**—*Science.* **87.** 18-19. [10 refs.]

In experiments carried out with New Hampshire chicks fed on a low manganese diet (Mn 10 p.p.m.), perosis was studied by means of X-ray pictures taken of the leg bones at regular intervals from the time of hatching until the chicks were seven weeks old. Comparisons were made with pictures taken of control chicks that received the same basal diet with the manganese content adjusted to 100 p.p.m. Calcification appeared normal in both groups, but in most cases the bones of the chicks on the low manganese diet were observed to be perceptibly shorter and thicker than those of the controls.—R. ALLCROFT.

PRESNELL, A. K. (1937). **The Relation of Vitamin D to Skin Respiration.**—*J. Biol. Chem.* **121.** 2-8. [2 refs.]

The oxygen uptake of the skins of rachitic rats was found to be only 60-70% of that of the skins of rats of the same age, and on the same diet, except that enough vitamin D to prevent rickets had been added. When vitamin D was added to the diet of the rachitic rats, as they recovered from rickets the skin respiration improved and reached the same figure as for the controls, showing that vitamin D has an effect on the respiration, and thus on the vitality of the skin.—R. ALLCROFT.

NORTHROP, J. H. (1937). **Chemical Nature and Mode of Formation of Pepsin, Trypsin and Bacteriophage.**—*Science.* **86.** 474-483.

A brief outline is given of the isolation and crystallization of pepsin, trypsin, chymo-trypsin and their precursors, and of the purification of a nucleo-protein, isolated from lysed culture of staphylococci, which has the properties of bacteriophage. The activity of the proteolytic enzymes appears to depend on some peculiar arrangement of the amino-acids, and some information on the structural configuration of the whole molecule has been obtained by studying the known changes in the molecule which affect the activity of the enzymes.—R. ALLCROFT.

TECHNIQUE.

GRIMBERG, A., MUTERMILCH, S., AGASSE-LAFONT, E., & PELLIER, H. (1937). Application de la technique des hémocultures en sang citraté et en sang bilié à l'isolement des streptocoques. [**The Technique of Isolating Streptococci in Citrated Blood and in Blood-Bile Media**].—*C. R. Soc. Biol. Paris.* **125.** 695-698. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 798. Signed C. C. OKELL].

Experiments are described showing that for the maximum growth of the coli-typhoid group of bacteria, blood medium should contain 3 to 4 per cent. sodium citrate. This concentration of citrate is not tolerated by streptococci and the concentration of citrate for the growth of the latter should not exceed 0·4 per cent. The methods applicable to the isolation of organisms of the coli-typhoid group from blood are not suitable for the isolation of streptococci. Blood to which 10 per cent. of bile has been added is equally suitable for the isolation of both the coli-typhoid group and the streptococci.

SHREWSBURY, J. F. D., & BARSON, J. (1937). **The Cultivation of Myco. Tuberculosis from Human Sputa.**—*Brit. med. J.* June 5th. 1154-1155. [2 refs.]

Of 135 specimens of human sputum found negative on microscopical examination, 29 (21·4%) showed the presence of *Mycobact. tuberculosis* on culture by the following method :– a volume of sputum up to 5 ml. is thoroughly mixed with an equal volume of 4% NaOH solution, incubated at 37°C. for 30 minutes and then centrifuged for one hour at 3,000 r.p.m. The supernatant fluid is decanted and the deposit neutralized with 4% HCl (five drops of acid are usually necessary). Sowings from the deposit are made on to Löwenstein's medium put up in screw-capped bottles. Incubation is at 37°C. and usually growth first appears after 21 days in the form of a very thin film.—H. BURROW.

DUMONT, E. (1937). Beitrag zur Differentialdiagnose parasitärer und nichtparasitärer Gebilde bei der mikroskopischen Untersuchung des Schweinekotes. [**Differential Diagnosis of Parasitic and Non-Parasitic Pig Diseases by Faecal Examination**].—*Inaug. Diss., Hanover.* pp. 24. 3 figs. [Numerous refs.] Also appeared in *Münch. tierärztl. Wschr.* **88.** 87-93.

In the microscopic examination of swine faeces, at least three kinds of vegetable tissue (vegetable remains, pollen and fungus spores) are sometimes mistaken for parasites by the inexperienced. Vegetable remains such as hairs of oats and barley, corn germ cells, etc., can be confused with lungworm larvae. Potato cells can be confused with eggs of nematodes. In pasture and silage-fed swine vascular bundles of plants are sometimes mistaken, when seen end-on, for worms' eggs or coccidial oocysts. Pollen of grass and corn are somewhat similar to worm eggs, and spores of Ustilaginae and Uredinae resemble the eggs of *Ascaris suis*. D. believes that by using samples of faeces enriched with a sugar solution, vegetable products will generally float and the possibility of error will be excluded. [The trained microscopist will not, of course, make the mistakes referred to above].
—M. BURKE.

I. TERRY, B. T. (1927). **A Rapid Method of Examining Tissue Microscopically for Malignancy : Preparation of Polychrome Methylene Blue.**—*J. Path. Bact.* **30.** 573-575.

II. DA ROSA, F. M. (1936). Application de la méthode de Benjamin-Terry à l'examen histologique des centres nerveux. Diagnostic rapide de la peste porcine. [**Examination of Nervous Tissue by Terry's Method : Rapid Diagnosis of Swine Fever**].—*Repos. Lab. Pat. vet., Lisboa.* **3.** 92-95. 4 figs. on 4 plates. [2 refs.] [In French].

III. DA ROSA, F. M. (1936). Technique rapide d'inclusion pour le diagnostic neuro-pathologique de la peste porcine. [**A Rapid Method of Inclusion of Nervous Tissue in Swine Fever Diagnosis**]. —*Ibid.* 96-97. 4 figs. on 4 plates. [In French].

I. T. cuts a thin slice of the tissue to be examined, stains it superficially on

one side with polychrome methylene blue, mounts it under a cover glass with the stained side up, and examines it by transmitting light through the unstained tissue. Fresh surgical tissues may be examined unfixed, but P.M. material is better fixed in formalin. A method of preparing polychrome methylene blue is described.

II & III. When examining nervous tissue in the diagnosis of S.F., WALDMANN has used a method of paraffin inclusion which takes three days. The author, for permanent mounts, describes a paraffin embedding method which can be done in one day, and, for rapid diagnosis, the application of Terry's technique. For the latter method with brain tissue, fixation is necessary, either for 24 hours in 10% formol saline, or by heating the tissue in 20% formol saline nearly to boiling point for three minutes.—NORMAN HOLE.

MASSOPUST, L. C. (1937). **Infra-Red Photography of Gross Anatomic Specimens.** —*Arch. Path.* **23.** 67-70. 8 figs. [2 refs.]

A simple photographic technique involving the use of the Eastman infra-red plate type 1R and the Wratten No. 25 filter is described. The method reveals details of structure and colour in tissues, *e.g.*, pneumonic lungs, renal calculi and placentas, not shown by ordinary photographic methods.—N. J. SCORGIE.

WALLHAUSER, A. (1937). **Preparation of Permanent Gross Colonies of Fungi for Teaching Purposes.**—*Arch. Path.* **23.** 681-682. 2 figs.

After a suitable growth of fungus has been obtained on a solid medium on a Petri dish, 5 c.c. formaldehyde (U.S.P.) is placed in the cover and the dish inverted. After 5-7 days the formaldehyde is removed and the preparation dried at room temperature for three weeks. The dish is then sealed with a petrolatum-paraffin mixture. Specimens thus prepared will keep for seven years.—N. J. SCORGIE.

WYCKOFF, R. W. G. (1937). **The Ultracentrifugal Purification and Study of Macromolecular Proteins.**—*Science.* **86.** 92-95. [Numerous refs.]

Until recently biological substances with large molecular weights such as proteins could only be separated from the tissues in which they occur by chemical methods, the most common being salting out with ammonium sulphate. Use of ultracentrifugation, in the sense of centrifuging at speeds sufficiently high actually to sediment out molecules, has shown that substances of high molecular weight can be isolated and purified without chemical agency. Moreover it has been shown that the molecular state of substances isolated in this way is nearer that prevailing in the animal or plant from which they are derived than is that of substances obtained by chemical methods. Ultracentrifugation has greatly advanced the study of virus diseases, especially those of plants. The proteins found to be the cause of the mosaic disease of potatoes and that of tobacco, have been isolated and purified. Other workers have used this method to concentrate the activity of the viruses which cause disease in man and animals.

Ever since the ultracentrifuge has helped to show that many of the plant viruses appear to be of protein nature and not a small living organism, controversy has raged round the question of infectivity and how a chemical substance could become infective in itself, but it is considered a possibility that viruses which are definite chemical molecules are products of abnormal metabolic processes within the cells. It still has to be discovered how the introduction of a heavy virus molecule into a living cell induces its protoplasm to break down according to the new pattern established by this molecule, but the idea is not incompatible with what has already been discovered about enzyme action. By supplying some of these viruses in pure form the ultracentrifuge points out a new experimental approach to this question,

as well as opening up a bright vista of rapid progress in the study of immunology since ultracentrifugation is also proving the ideal method of studying the chemistry of antigens and antibodies.—JAMES STEWART.

MISCELLANEOUS.

GREAT BRITAIN. (1937). **Agriculture Bill.** pp. 26. London: H.M. Stat. Off. [8vo] [6d.]

The Bill as a whole was brought in to assist farmers to increase the fertility of the land and animal production. Part I sets out the conditions under which the government will subsidize farmers for the cost of lime and basic slag, for application to farm land. Part IV concerns the eradication of infectious diseases, chiefly bovine tuberculosis, though any other disease may be dealt with under the Act.

To provide the necessary technical staff for this purpose the Minister of Agriculture is empowered to take over such veterinary inspectors as were formerly engaged on work on disease control and milk hygiene under local government departments.

The Minister is further empowered to subsidize farmers, until January 31st, 1941, for the eradication of bovine TB., to pay a premium of one penny per gallon on milk produced by a registered producer under the Agricultural Marketing Act, 1931, to require compulsory slaughter of animals affected with diseases being eradicated, to declare " attested areas ", in which any particular disease is absent and to introduce a free veterinary inspection scheme for the benefit of poultry breeders.

Rules governing the pensions due to veterinary inspectors are also dealt with.

—J. E.

GREAT BRITAIN. (1938). **Report of Poultry Technical Committee of Great Britain.** pp. 76. 2 tables, 1 appendix. London: H.M. Stat. Off. [8vo] [1s.]

The committee was appointed in September, 1935 " to consider the present methods of supply and distribution of hatching eggs, day-old chicks and breeding stock in Great Britain, both generally and with particular reference to the reduction poultry mortality. . . ."

It held many meetings, visited poultry-raising areas, collecting evidence on losses, and found that the poultry industry was suffering appalling loss from deaths in fowls of all ages. According to evidence from egg-laying trials, the mortality rate in young hens rose from about 6·6% in 1926 to 17·7% in 1936, and losses in many commercial flocks have exceeded 50% during a season.

The committee had difficulty in forming an opinion on the causes of the losses and on the relative importance of the various diseases, and quotes some widely divergent diagnostic results arrived at by three laboratories. There is obviously room for considerable improvement in poultry disease diagnostic work in the country.

It was recommended that a Poultry (Stock Improvement) Commission be set up with power to enforce the compulsory registration of all distributors of stock, hatching eggs and day-old chicks, and the founding of a voluntary grading scheme for the production of improved stock; the latter to be made attractive by a system of premiums (government subsidy) and by the offer of free veterinary services for P.M. diagnosis and special advice, the former by laboratory workers

and the latter by veterinary inspectors of the Division of Animal Health of the Ministry of Agriculture. It was also recommended that research into poultry diseases should be intensified and carried on in conjunction with P.M. diagnosis. The Committee hoped that the Agricultural Research Council would found an institution, which ought to include a full-scale commercial poultry farm, for this purpose, as the existing veterinary research and diagnostic institutions are already fully occupied.—J. E.

ANON. (1937). **Control of Poultry Diseases. Memorandum describing Action of Ministry under the Diseases of Animals Acts, 1935.**—*Harper Adams Util. Poult. J.* **12.** 96-100. [See also *V. B.* **7.** 543].

It is stated that in view of their prevalence among poultry stocks of such conditions as fowl pox, bacillary white diarrhoea, fowl typhoid, tuberculosis, parasitic infections, and to a lesser extent, fowl cholera and laryngotracheitis, the industry does not desire any compulsory control measures for these diseases. It is considered that the cost of administration would be too expensive, and would unduly interfere with the normal business of poultry keepers. The Ministry is, therefore, relying on voluntary methods, coupled with advisory leaflets and advice from veterinary investigation officers. The control measures available are described. It is necessary, however, to legislate for serious exotic diseases such as fowl plague and Newcastle disease. The present orders are summarized ; they are :– (1) The Fowl Pest Order of 1936, (2) Poultry and Hatching Eggs (Importation) Order 1936, and (3) Poultry Markets and Receptacles (Disinfection) Order of 1936.
—R. FISHER.

INDIA. (1936). **Agriculture and Animal Husbandry in India 1933-1934 and 1934-1935. Part II. Animal Husbandry.** pp. 67. 11 figs. on 5 plates, numerous tables, 6 appendixes, 1 map. Delhi : Manager of Publications. [4to] [Re.1] [1s. 9d.]

CONTAGIOUS DISEASES AND THEIR CONTROL.—The total reported mortality from contagious diseases among cattle in the British provinces of India is as follows :– 286,592 during 1933-34 and 199,458 during 1934-35. RINDERPEST accounting for 63% and 62% of these figures respectively. The percentage of deaths among animals inoculated against RINDERPEST was 0·23 and 0·17 respectively during the same periods. Reference is made to the extensive use of the goat-virus method of vaccination with a consequent drop in the demand for anti-rinderpest serum.

The systematic treatment of SURRA with " naganol ", alone or in combination with tartar emetic was extensively tested and the results are reported to have been very satisfactory. Reports by Disease Investigation Officers indicate that fatal outbreaks of surra amongst cattle are far more common in various parts of India than was previously understood.

LOCAL DISEASES AND PUBLIC HEALTH WORK.—Figures are given of numbers of cases treated at veterinary hospitals, etc. and mention is made of various routine activities of the provincial veterinary staffs.

ANIMAL HEALTH.—A draft bill and model rules have been prepared by the Imperial Council of Agricultural Research for the prevention and control of animal diseases.

An effective method of control against NASAL GRANULOMA was developed. The life-history of the causal organism, *Schistosoma nasalis*, was studied at the Madras Veterinary College. Other investigations undertaken included EQUINE ENCEPHALOMYELITIS at the Punjab Veterinary College, " KUMRI " at the Patna

Veterinary College, ENDEMIC HAEMATURIA at the Bengal Veterinary College and "AVIAN DISTEMPER" by the Burma Veterinary Department.

VETERINARY EDUCATION AND OTHER COURSES.—It is stated that provision for veterinary education available in India continues to be incomplete and reference is made to proposals adopted, after reference to the Advisory Board of the Imperial Council of Agricultural Research, for a uniform curriculum for all veterinary colleges in India.—J. C. WALLACE.

OLVER, A. (1937). **Live-Stock Improvement in India.**—*Agric. Live-Stk. India.* **7.** 458-468. [1 ref.]

A comprehensive note of the recommendations and conclusions as to the lines along which the development of livestock and livestock industry and its products should, in O's opinion, proceed in India.—E. E. JELBART.

BRITISH EAST AFRICA. (1936). **Conference of Governors of British East African Territories. Conference on Co-Ordination of General Medical Research in East African Territories. Held at Nairobi, 20th to 22nd January, 1936.** pp. 97. 18 appendixes. Nairobi: Govt. Printer. [8vo]

The agenda are divided into two sections, scientific and administrative. The main part of the report consists of the discussion on the various subjects dealt with at the conference, the latter being included in the appendixes. A joint meeting of the General Medical and Veterinary Conferences considered the following subjects :–

HELMINTHIASIS.—The control of bovine and porcine cysticercosis and human taeniasis was discussed.

BRUCELLOSIS.—Memoranda on human and bovine brucellosis were contributed. The conference recommended that further research should be centralized at the Veterinary Laboratory, Kabete.

RABIES.—The Director of Medical Services, Uganda, reported on a strain of rabies which was in its 51st passage in rabbits; the incubation period was never less than ten days and in the last three passages had returned to 13, 14 and 15 days. Discussion followed on the prophylactic value of antirabies vaccine in dogs and the epizoology of the disease.

TUBERCULOSIS.—Memoranda were given on human and bovine TB. Bacteriological work is to be continued at the Veterinary Laboratory, Entebbe.—J. C. W.

BRITISH EAST AFRICA. (1936). **Conference of Governors of British East African Territories. Conference on Co-Ordination of Tsetse and Trypanosomiasis (Animal and Human) Research in East Africa. Held at Entebbe, 29th to 31st January, 1936.** pp. 87. 7 tables. [12 refs.] Nairobi: Govt. Printer. [8vo]

The progress made on the programme of research drawn up at the 1933 Conference was considered and is dealt with in memoranda [see appendixes to the report] submitted by the Directors of Medical and Veterinary Services, Veterinary Research Officers, etc. The actual research work carried out is published in the Annual Reports of the departments concerned.

The subjects of veterinary interests considered by the conference included :– (a) experiments on relatively resistant ruminants with strains of *Tryp. rhodesiense* and *Tryp. gambiense*; (b) retention of acquired characteristics by trypanosomes during cyclic evolution in the body of the tsetse fly; (c) evolution of different trypanosomes in the body of tsetse and other biting flies and relationship to environment (climate, etc.) of cyclic transmissibility and pathogenicity; (d) control

of tsetse fly ; (e) trypanosomiasis of pigs, and (f) chemotherapy of animal trypanosomiasis.

Appendix 1 gives a summary of the programme of tsetse and trypanosomiasis research for 1936-1937.—J. C. WALLACE.

KENYA COLONY AND PROTECTORATE. (1937). **Stockowners' Conference, Held at the Law Courts, Nairobi, on March 10th & 11th, 1936.** pp. 69. Nairobi : Govt. Printer. [8vo]

The agenda consisted of various resolutions under the following headings :– (a) the control of stock diseases ; (b) the control of movement of stock ; (c) the dairy industry, and (d) general, put forward by stockowners' associations for discussion at the Conference. The following items were of veterinary interest :–

RINDERPEST.—Control was discussed and it was resolved that the veterinary authorities should continue research to effect further improvements in methods of immunization.

FOOT AND MOUTH DISEASE.—Resolutions were discussed to the effect that the disease should be made notifiable and that fresh measures of control were required. After discussion it was decided that the question of control should be left in the hands of the veterinary authorities and that administrative officers should be asked to notify to the veterinary authorities outbreaks in native reserves adjoining European stock areas.

EAST COAST FEVER.—The Chief Veterinary Officer agreed to consider sympathetically a resolution that the quarantine period should be reduced.

MEASLES (*Cysticercus bovis*).—A motion that the Veterinary Laboratory be asked to co-ordinate the necessary authorities with a view to eliminating MEASLES in cattle was discussed. The difficulties of controlling and eradicating the disease were pointed out by the veterinary officers. A proposal was carried that the Chief Veterinary Research Officer should investigate the possibility of testing cattle for MEASLES under field conditions. A resolution that the present restrictions on MEASLES in beef are sufficiently stringent and do not call for any increase was considered and carried. It was brought forward because Nairobi Municipality proposed reducing the number of measles cysts allowed without condemnation of the carcass from six to one ; under the present standard 10·75 % of carcasses were condemned. An amendment was passed requesting the Municipality to take no action without consulting stockowners.—J. C. WALLACE.

FINLAND. (1937). Eläintautilaki. [**Law for the Control of Animal Diseases**]. pp. 3. Helsingfors : Finlands Författningssamling.

A new law has been passed for the control of animal diseases in Finland as from 1938. Lists have been made of diseases which are at present under such control and of those which may be put under such control in the future. In the first group are anthrax, tuberculosis, haemorrhagic septicaemia in swine, glanders, fowl cholera, fowl typhoid, bovine brucellosis, blackleg, epizootic lymphangitis, dourine, foot and mouth disease, rinderpest, contagious bovine pleuro-pneumonia, equine infectious anaemia, swine influenza, sheep pox, swine fever, rabies, fowl plague and mange.

In the second list are the following less important diseases :– strangles, swine erysipelas, piroplasmosis, bovine malignant catarrh and influenza.

The important diseases are declared notifiable and control measures are put into force by district veterinary surgeons. Affected animals may be slaughtered at the cost of the state. In some cases the full value is paid and in others three-quarters of the value. It is intended to issue detailed instructions from time to time.—R. STENIUS (HELSINGFORS).

PEASE, Dorothy. (1937). **The Insect Menace in the Bacteriology Laboratory.**—*J. Bact.* **33.** 619-624. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 793. Signed G. S. WILSON].

This article contains a useful warning to bacteriologists – especially those who are studying problems of variation and of so-called life-cycles. It is pointed out that cultures in Petri dishes, or in tubes plugged with cotton wool, may become contaminated with other bacteria or with moulds by mites which wander in from the outside. PUNTONI reported that an apparent return to virulence in BCG cultures was traced to contamination by virulent tubercle bacilli carried from neighbouring cultures by mites. In mould cultures mites may breed under cover of the mycelium and remain undetected till sought for with suitable magnification and illumination. The larvae of some mites are so small as to be invisible without a strong hand lens or microscope. Young cockroaches may also find their way into Petri dishes, and cause considerable trouble. Methods are described in detail for protecting against the mite menace. Metal is preferred to wood in laboratory furnishings. Flies, which may carry mites, are excluded by gauze mesh window screens. The laboratory is swilled down frequently with disinfectant. Shelves for stock cultures are brushed with equal parts of turpentine and linseed oil, and are provided with legs standing in broad shallow basins of lysol solution. Benches, tubes, and Petri dishes are wiped with 50 per cent. acetic acid. Plate and test-tube cultures suspected of being contaminated with mites are placed in a covered jar containing an open dish of para-dichlorbenzene crystals. Provided the cotton wool plugs are loosened to allow the passage of gases, mites are killed by this treatment in 1-4 hours. The process is repeated every two days for 12 days to ensure the destruction of the larvae as they hatch from the eggs. Open dishes of para-dichlorbenzene are placed in cupboards and incubators where infestation is suspected.

WOLBACH, S. B. (1937). **Vitamin Deficiency Experimentation as a Research Method in Biology.**—*Science.* **86.** 569-576. [15 refs.]

The important morphological consequences of deficiencies of the vitamins A, C and D are discussed, and the possibilities arising from the use of vitamin deficiencies and related repair phenomena as a method of investigating the organization of the cell and of tissues are outlined.—R. ALLCROFT.

OFFICIAL AND OTHER REPORTS.

GREAT BRITAIN. (1937). **Ministry of Agriculture and Fisheries. Report of Proceedings under the Diseases of Animals Acts for the Year, 1936.** [KELLAND, J.] pp. 102. Numerous tables, 1 graph, 5 appendixes. London: H.M. Stat. Off. [8vo] [1s. 6d.]

In the introduction reference is made to the government's proposals for the initiation of a large-scale campaign for the eradication of diseases of animals in Great Britain. These proposals are described in the Memorandum on the Financial Resolution issued in June, 1937 (Cmd. 5493).

Part I of the report deals with the incidence of notifiable contagious diseases of animals; the list of notifiable diseases remains unchanged, except for the addition, under the Fowl Pest Order of 1936, which came into operation on 11th January, 1937, of FOWL PEST, including FOWL PLAGUE and NEWCASTLE DISEASE. Statistical tables are included in Appendix I showing the distribution of notifiable diseases in each county of Great Britain.

During the year there were 67 outbreaks (60 in England, and 7 in Wales) of FOOT AND MOUTH DISEASE. There were 13 new centres of infection and full details of these are given. Twelve initial or "parent" outbreaks occurred; despite the usual exhaustive enquiries, in none of these was the original source of infection definitely identified.

According to the return furnished by the local authorities, TUBERCULOSIS in one or other of the forms referred to in the Tuberculosis Order of 1925 was reported to exist on 26,744 premises during 1936 as compared with 25,032 premises in 1935. The number of animals examined by veterinary inspectors rose from 415,667 to 438,267. The examination of these animals resulted in 23,802 cattle being declared to come within the scope of the order. Of these, 23,716 were slaughtered by local authorities, and the total sum paid as compensation was £100,342, an average of £4. 4s. 8d. per head. The numbers of affected animals in the four categories were (a) cows giving tuberculous milk, 602; (b) cows with TB. of the udder, 5,255; (c) bovine animals with tuberculous emaciation, 5,162, and (d) bovine animals with a chronic cough and clinical signs of TB., 112,783.

At the end of the year there were 192 Attested Herds in England and Wales, comprising 7,229 cattle; 50 of the herds attested were licensed to produce "Tuberculin Tested" milk under the Milk (Special Designations) Order of 1936.

There were 255 outbreaks of SHEEP SCAB during the year as compared with 477 in 1935. This figure is the lowest recorded for 32 years, and the third lowest on record since 1870. Tables are given showing the distribution of the disease, the number of outbreaks reported by owners and the number discovered by inspectors. The area comprizing the counties bordering the Pennine Range showed the greatest improvement – 59 cases in 1936 as compared with 190 in 1935. Areas to which Parts II and III of the Sheep Scab Order of 1928 were applied are described. 17 sheep dips were approved in 1936; the standards to which dips must conform are outlined.

The number of suspected outbreaks of SWINE FEVER was 15,233; of these 1,873 were confirmed as against 2,049 in 1935. Enquiries showed that 364 outbreaks were due to market infection or to infection during conveyance to or from markets, and that in 559 other outbreaks the affected swine had recently passed through a market and may thus have become infected. Approximately 82% of the outbreaks occurred in the Scheduled Area to which the Regulation of Movement of Swine Order of 1922 applies.

During 1936, 468 cases of ANTHRAX were confirmed, as compared with 386 in 1935. A table of probable origins is given.

There were 111 outbreaks of PARASITIC MANGE of equines involving 35 counties, as compared with 99 outbreaks in 32 counties in 1935.

This section of Part I concludes with a reference to the poultry orders issued in December, 1936.

Appendix II of the report consists of a memorandum issued by the Ministry of the Control of Poultry Diseases [*V. B.* **8.** 106].

Part II deals with the subject of importation with regard to preventing the introduction of contagious diseases of animals into Great Britain and also a new order entitled the Diseases of Animals (Importation of Therapeutic Substances) Order of 1936 was issued and its main objects are described.

Part III deals with the protection of animals during transit and with exportation of horses, and Part IV with the export of pedigree and other livestock and of raw animal products under the regulations of the importing countries.

In Part V (miscellaneous) the working of the Warble Fly (Dressing of Cattle) Order of 1936 is described and a note on the annual meeting of the Office international des Epizooties is included.—J. C. WALLACE.

ANON. (1937). **Poultry Disease Research at the Ministry's Veterinary Laboratory, New Haw, Weybridge [1936].**—*Harper Adams Util. Poult. J.* **22.** 361-363.

The main investigation carried out during 1936 was concerned with INFECTIOUS LARYNGOTRACHEITIS. Forty-six outbreaks were confirmed at the laboratory during the year and in each case the diagnosis was supported by animal inoculation. Experimental work was carried out to compare the strains of the virus received, the viability outside the animal body under varying climatic conditions, and differentiation of the disease from other similar conditions met with in the trachea of the fowl.

Investigations are in progress to ascertain the efficiency of the FOWL TYPHOID vaccine following the elimination of " carrier " birds by blood testing, as a means of eradicating this disease in an area where it has been prevalent over a long period.

During the year 1936, the following routine poultry services were carried out:– 164,126 agglutination tests for the detection of carriers of PULLORUM DISEASE; 5,197 P.M. examinations on fowls; 264,861 doses of FOWL POX vaccine issued; 20,807 doses of FOWL TYPHOID vaccine issued. During the year a statistical analysis of the P.M. examination records of birds received at the laboratory from laying tests during the period 1924-1935 inclusive was carried out.—R. F. GORDON.

BRITISH SOMALILAND. (1937). **Annual Report of the Veterinary and Agricultural Department for 1936.** [PECK, E. F.] pp. 20. 1 graph. [fcp] [Mimeographed].

STAFF.—In addition to the single European officer who is responsible for the work of both sections of the department, there were 11 native stock or garden inspectors.

VETERINARY WORK OF THE SOMALILAND CAMEL CORPS (K.A.R.).—The Veterinary and Agricultural Officer was in veterinary charge of the ponies and camels of the corps; and he gives a detailed description of the state of health of these animals and records some dietetic experiments carried out on them. The camels were free from TRYPANOSOMIASIS and the ponies from AFRICAN HORSE-SICKNESS as a result of preventive measures taken; both diseases are prevalent elsewhere in Somaliland. *Haemonchus longistipes* infestation in camels is controlled by regular dosing with copper sulphate (1 %), worms in ponies by chenopodium oil (10 ml.) and GASTRIC HABRONEMIASIS in ponies and mules by carbon disulphide (15 ml.). A paralytic disease of camels believed to be TICK PARALYSIS is briefly described. It was found that the giving of common salt *ad lib.* to camels had a good effect on their health and resulted in a decrease in the incidence of boils, which were previously prevalent. Normal camel blood was found to have a haemoglobin content averaging 62 by the " Neoplan " haemoglobinometer. A list of animal parasites collected in 1936 is given.

VETERINARY PROTECTORATE WORK.—A general account of the diseases of native-owned livestock is given. Outbreaks of RINDERPEST occurred and were dealt with by quarantine and glycerin pulp vaccine. CONTAGIOUS BOVINE PLEURO-PNEUMONIA was observed. Thousands of doses of " naganol " were given to camels to cure TRYPANOSOMIASIS.

ANIMAL INDUSTRY.—Grazing land is not plentiful, and is in danger of being destroyed by overstocking. A report is given on the effect of skin parasites and diseases on hides. The estimated animal populations in British Somaliland are 1,000 equines, 30,000 cattle, 2,500,000 sheep, 2 million goats, 1,000 donkeys and 1,500,000 camels.—J. E.

FEDERATED MALAY STATES AND STRAITS SETTLEMENTS. (1937). **Annual Report of the Veterinary Department for the Year 1936.** [WHITWORTH, S. H.] pp. 40. 12 tables, 1 map. Kuala Lumpur: Govt. Printer. [8vo] [$1] [2s. 4d.]

The veterinary department of the F.M.S. and S.S. were merged into one unit at the beginning of the year and for the first time there is a common report for both territories.

STAFF.—There were nine members of the European Asiatic veterinary staff, nine Asiatic assistant veterinary surgeons, 18 Asiatic veterinary inspectors, 10 Asiatic veterinary assistants, two livestock inspectors, 65 veterinary police constables and seven clerks in the employ of the department. The total expenditure was $202,971 and the revenue $88,939.

ANIMAL DISEASES.—Several outbreaks of a disease believed to be NECROBACILLOSIS occurred in goats in Perak: the morbidity was high, but sheep were resistant. It was thought that the goats contracted the disease after browsing on the plant *Mimosa pudica*, which has small thorns. A detailed description is given, and the disease was found to be quite distinct from goat pox. Two small outbreaks of FOOT AND MOUTH DISEASE in a mild form occurred in Perak and Selangor respectively. There was one outbreak of GOAT POX in Perak, 195 cases being noted, with 144 deaths. SWINE FEVER was observed in an abattoir in Perak and was prevalent in a large coastal area. There were 695 cases, with 512 deaths. Some cases were also noted at the Singapore abattoir. A detailed description of the disease is given. The ultimate criterion for naming it SWINE FEVER (cross immunity tests with European S.F.) is still lacking. CONTAGIOUS CAPRINE PLEURO-PNEUMONIA, which caused great loss in 1935, occurred in the survivors of the old outbreak: it was stamped out by slaughter of all goats in the area. Short notes are given on FOWL POX, "DIPHTHERITIC STOMATO-PHARYNGITIS" in fowls, worm infestation and leucocytozoon infection.

RESEARCH.—An account is given of experimental treatment of five horses affected with "DRY COAT" (anhydrosis; non-sweating). The following substances were given in combination, though not all concurrently:– germinated grain and Katchung hijau sprouts (for vitamin C), sodium chloride, glucose D, whole adrenal gland, an iron, copper and strychnine mixture and yeast (for vitamin B complex). Partial improvement was obtained in the skin dysfunction, and the horses improved in general condition. A brief note is given on experimental FOWL POX vaccines.

ANIMAL HUSBANDRY is dealt with in detail. A Chinese-speaking livestock inspector (new appointment) was attached to headquarters at Kuala Lumpur to assist in educating Chinese pig and poultry keepers in hygiene. Observations were made on the sexual physiology of the Malayan buffalo, and details are given. Animal slaughter and meat inspection statistics are included. A livestock census for all Malaya is given for oxen, buffaloes, sheep, goats and swine. [See also *V. B.* **8.** 124].—J. E.

UNION OF SOUTH AFRICA, CITY OF JOHANNESBURG. (1935). **Report of Director of Abattoir, Live Stock Markets, Veterinary Services, Ice and Cold Storage Department, for the Period 1st July, 1934, to 30th June, 1935.** [IRVINE-SMITH, J.] pp. 34. Numerous tables, 1 photograph, 6 appendixes. Johannesburg: Radford, Adlington, Ltd. [fcp].

UNION OF SOUTH AFRICA, CITY OF JOHANNESBURG. (1937). **Report of the Director of Abattoir, Live Stock Markets, Veterinary Services, Ice and Cold Storage Department, for the Period 1st July, 1935, to 30th June, 1936.** [IRVINE-

SMITH, J.] pp. 44. Numerous tables, 6 appendixes. Johannesburg: Radford, Adlington, Ltd. [fcp].

The reports give a short history of the development of the abattoirs, livestock markets, quarantine market, cold storage, ice plants and by-products plant which were founded in 1907.

The number of animals passing through the livestock markets and abattoirs is given: about one million animals pass through the market and half a million through the abattoir every year.

Statistics on diseases causing condemnation of carcasses are given and also notes on the more important ones: ONCHOCERCIASIS was observed, but the number of animals affected was small. The percentage of carcasses affected with *Cysticercus bovis* varied from 2·5 to 60 in different consignments.

It is stated that the cost to the farmers for marketing facilities, including pen accommodation, water, weighing and veterinary inspection, is under fourpence per animal, while in the abattoirs the cost to the butchers for slaughtering, buying and selling facilities, lairage accommodation, hanging hall, weighing, hot and cold water, meat inspection, stamping, etc., is just over 1s. 1d. per animal.

A new slaughter hall has lately been added. This has been built on the most modern principles and is capable of dealing with over 300 cattle per day and the electrical method of stunning is in operation.

Pig carcasses are often found affected with cysticerci and during the last 11 years the percentage found has varied from 2·89 to 6·49.

Particulars are given of an Insurance Fund in operation for the purpose of protecting owners against the loss of animals by condemnation after slaughter in the abattoirs.

The Department renders assistance in the training of students for the B.V.Sc., Pretoria University, and supplies pathological specimens to the Medical Research Institute for students preparing for the diploma in Public Health, also to the University of Witwatersrand.

All animals belonging to the City Council come under the care of the Veterinary Department, including mules, horses and oxen, and examination is constantly being made of dairy cows supplying milk to the town of Johannesburg. Full details are given with regard to the various diseases affecting dairy cows. The animals in the Zoological Gardens are also under the care of the Veterinary Department.

A veterinary laboratory forms a useful part of the Department and milk from approximately 18,000 dairy cows was examined.—T. DUNLOP YOUNG.

I. MOROCCO. (1937). Rapport sur le fonctionnement du laboratoire de recherches du service de l'élevage du Maroc pendant l'année 1936. [**Report of the Research Laboratory of the Livestock Service for 1936**]. [VELU, H.] —*Arch. Inst. Pasteur Alger.* **15.** 124-137. [18 refs.]

II. MOROCCO. (1937). Extrait du rapport sur le fonctionnement du laboratoire de recherches vétérinaires des troupes du Maroc pendant l'année 1936. [**Report of the Army Veterinary Research Laboratory for 1936**]. [VELU, H.] —*Rev. vét. milit.* **21.** 83-88.

I. BRUCELLA infection, DOURINE, and PULMONARY STRONGYLOSIS in sheep presented the chief problems in Morocco during 1936. The first mentioned was treated experimentally with living vaccines in a fatty base; to the second chemotherapy was applied, controlled by serological examinations, while the last mentioned was treated with aqueous extracts of species of pyrethrum. "Zothélone" is being tried for certain PIROPLASMOSES and "gonacrine", novarsenobenzol, and

azo dye compounds for STRANGLES. An EQUINE INFECTIOUS PARAPLEGIA, now becoming more prevalent in Morocco, is thought to be a form of strangles. Special mention is made of ANTHRAX, VARIOLA of pigs and the hygiene of milk, water and food.

The report details the personnel of the laboratory and analyses the work performed in each of the services. In the biological chemistry service an investigation is proceeding into the toxicity of " naganol ", when given in repeated small doses for the cure of dourine, by an examination of the blood and urine of 5 donkeys which are being dosed every ten days.

II. This is practically the same as I.—C. V. WATKINS.

BOOK REVIEWS.

GAIGER, S. H. [F.R.C.V.S., Late Professor of Veterinary Pathology, University of Liverpool; formerly Director of Research, Animal Diseases Research Institute, Scotland; and Principal and Professor of Pathology, Glasgow Veterinary College], & DAVIES, G. O. [M.V.Sc., M.R.C.V.S., D.V.H., Lecturer in Veterinary Pathology, University of Liverpool, and Honorary Lecturer, Liverpool School of Tropical Medicine; formerly member of the Research Staff of the Foot-and-Mouth Disease Research Committee; and Veterinary Inspector, Ministry of Agriculture and Fisheries]. (1938). **Veterinary Pathology and Bacteriology.** pp. x + 712. 198 figs., numerous tables, 1 appendix. London: Baillière, Tindall and Cox. [2nd Edit.] [8vo] [25s.]

This is the second edition of this now well-known book. Numerous alterations have been made to bring it up to date, including a number of new illustrations. One result is that the new edition contains 100 pages more than the first edition. An improvement is that numerous references to original articles are given.

As rightly pointed out in the preface to the first edition, a book of this kind is mainly intended for students and the information therein must be condensed if the book is to be of a handy size. Only those with a wide knowledge of students' requirements are able to decide what must be put in and what may safely be omitted. Every specialist reader will find something to criticize and feel that unnecessary emphasis is given to some things and not enough to others.

In a book covering such a wide field it is not surprising that occasional errors occur. In the chapter on the salmonella group no mention is made of the characteristic reaction in litmus milk, *viz*, the rapid acidification followed by slow alkalinization. It is merely stated that the milk becomes alkaline. On page 225 it is stated that to recover *Brucella abortus* from milk one should inject the sediment from centrifugalized milk into a g. pig. The more usual practice is to inject the cream layer or cream layer and sediment combined.

The book is well produced and is a mine of information in a concise form. It can be thoroughly recommended to students and others requiring this type of book.—G. SLAVIN.

HIERONYMI, E. (1937). Untersuchungen über tierische Brucellosen. [**Animal Brucellosis**].—*Schr. königsb. gelehrt. Ges. naturw. Kl.* **14.** No. 2. pp. 47. [Numerous refs.] Halle (Saale): Max Niemeyer. [8vo] [RM.2].

A brief, non-critical review of the history of research upon the genus *Brucella* up to the present day. Whilst much of the essential research work is mentioned in conjunction with a useful bibliography, there are certain striking omissions which

detract from the value of this work ; thus the fundamental studies of G. S. WILSON and his followers upon the antigenic structure of members of the genus are not mentioned. In spite of such omissions, however, this review will serve as a useful guide to those desiring to read up the literature dealing with this subject. The value of the publication would be enhanced, from the point of view of the reader's convenience, by the division of the material into chapters or sections having descriptive headings.—E. J. PULLINGER.

HAAGEN, E., & KRÜCKEBERG, B. (1937). Zum Psittakoseproblem. Betrachtungen auf Grund von Beobachtungen und Untersuchungen im Jahre 1935-1936. [**The Psittacosis Problem. Observations in 1935-36**].—*Veröff. VolksgesundhDienst., Berl.* **48.** No. 4. pp. 94. 8 figs., 2 charts, 2 maps. [Numerous refs.] Berlin : Richard Schoetz. [8vo] [RM.4].

Psittacosis is discussed under the following headings :– the progress of the disease in Germany prior to the pandemic of 1929-1930 ; the pandemic of 1929-1930 ; the disease during the years 1931-1935 ; a report of the cases of psittacosis in man which have been studied ; the clinical examination for human psittacosis ; the epidemiology ; the spread of infection in German bird breeding establishments ; the aetiology, and control. A bibliography is included. The publication is written almost entirely from the human standpoint and apart from the general interest of the subject, only the last few chapters are of value to the veterinarian. The chapter on aetiology gives a concise description of the virus and of laboratory methods of diagnosis of the infection, including methods of virus culture. Methods of control practised in Germany are similar to those adopted elsewhere and include the regulation of the importation of susceptible species of birds under quarantine restrictions and the control of aviaries which house such birds. The legislative aspect of infection in the human subject is similar to that of other infectious respiratory diseases.—E. J. PULLINGER.

HOLMES, E. [M.A., M.D., Fellow and Tutor of Downing College and University Lecturer in Biochemistry]. (1937). **The Metabolism of Living Tissues.** pp. x + 235. 2 figs. London : Cambridge University Press ; New York, Toronto, Bombay, Calcutta, Madras : Macmillan ; Tokyo : Maruzen Co. Ltd. [8vo] [7s. 6d.]

This highly original book is a masterpiece of its kind. Its aim is to provide a survey of the present range of knowledge in dynamic biochemistry, but the approach is primarily biological, and therefore within the reach of those engaged in medicine and veterinary science.

Apart from general chemical considerations of subjects such as enzymes, oxidation-reduction mechanisms, vitamins and hormones, the author focusses attention on the metabolic activities of various tissues. For instance, Chapter 6 is headed " The Liver ; nitrogen metabolism " and Chapter 7 " The Liver ; metabolism of carbohydrate and fat ". The functional activities of the organ are then discussed in relation to the chemical compounds involved, without undue stress on molecular transformations as such. In similar vein Chapter 2 deals with the correlation of metabolism of different tissues and discusses chemical co-ordinations effected by hormones and the correlating functions of the central nervous system.

This treatment renders it easier to visualize the active dynamic aspect of tissue metabolism and provides a unified background for whatever purely chemical and physical knowledge the reader already possesses or may later acquire. Within its scope the book supplies all the essentials of present day knowledge, and when

expected topics are omitted it is only because they are adequately dealt with in recent text-books or other monographs.—H. H. GREEN.

BAUM, H. [Geheimer Medizinalrat, Dr. med et. med. vet. et. phil., weil. o. Professor der Veterinäranatomie der Universität Leipzig], & GRAU, H. [Dr. med. vet., Professor der Veterinäranatomie an der Tierärztlich-landwirtschaftlichen Hochschule zu Karadj (Iran) und a. o. Professor an der Universität Leipzig]. (1938). Das Lymphgefässystem des Schweines. [**The Lymphatic System of Swine**]. pp. viii + 162. 47 figs. [Numerous refs.] Berlin: Verlagsbuchhandlung Paul Parey. [4to] [RM. 14.50].

Two years before his death in 1932, Professor BAUM completed his MS. of a monograph on the lymphatic system of the pig, but its printing had to be postponed. Recently GRAU revised the text with full consideration for the new literature on the subject and the present book is the result. The high standard set by ELLENBERGER and later, by BAUM, of the world-famous veterinary anatomy school at Leipzig, is fully maintained, and the text is above criticism, being matched in excellence by the half-tone drawings.

It seems worth while to mention that the terms " lymph centre ", " lymph node " and " lymph vessel " (abbreviations " lc ", " ln ", or " lnn ", and " l ") are used: it would be a good thing if they were to be universally adopted and if the misnomer " lymph gland " were to be dropped.

The book is strongly recommended and ought to be considered indispensable for anatomists and meat inspectors.—J. E.

HORSBURGH, D. B., & HEATH, J. P. [School of Biological Sciences, Stanford University]. (1938). **Atlas of Cat Anatomy.** pp. 39. 42 figs. California: Stanford University Press; London: Humphrey Milford Oxford University Press. [4to] [4s. 6d.]

This book consists of a loose-leaf collection of 42 good line drawings in black and white, with hardly any text; it covers the bones, muscles, nervous system, vascular system, digestive system and urogenital system.

While the drawings are not very detailed this " atlas " should be a handy guide for veterinary students and there is room on the pages for the user to make additions, *e.g.*, to paint in the blood vessels and nerves as they cross muscles, and to make notes.—J. E.

ROGERS, L. [K.C.S.I., LL.D., M.D., F.R.C.P., F.R.C.S., F.R.S., Hon Treasurer Research Defence Society]. (1937). **The Truth About Vivisection.** pp. x + 182. 9 figs., 9 tables. London: J. & A. Churchill Ltd. [8vo] [5s.]

The object of this book is to educate the public to the true facts about vivisection and to oppose the anti-vivisection societies, which, it is stated, have obtained over £500,000 by voluntary contributions since 1912, the date when the Royal Commission on Vivisection (appointed in 1906) made its report.

The evidence on both sides which was given to the Commission is quoted at length and the total inability of the anti-vivisectionists to substantiate their allegations is made clear. The author gives numerous examples of diseases in man and animals which are at the present time held in check by methods of immunization or chemotherapy discovered and standardized by means of animal experiment, without which they could not have been evolved. The chapter on animal diseases is very informative and contains many references to recent reports.

All veterinary surgeons ought to buy the book, so as to be able to enlighten other members of the public.—J. E.